

At Home in the Woods

Lessons Learned in the Wildland/Urban Interface



FEMA

Dedication



This book, like this monument in Glenwood Springs, Colorado, is dedicated to firefighters who have given their lives to protect others from wildfires. These bronze figures represent the 14 firefighters who died fighting the Storm King Fire in 1994. The Coal Seam Fire of 2002 burns in the background.



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Introduction

A SIMPLE WOOD-FRAMED HOME sits tucked within a rich green forest. Perched on a hillside, its deck affords a spectacular view of the valley below, as do the large picture windows and glass doors. The shake shingle roof gives the home an old-style authenticity perfect for the rustic landscape. A stack of firewood has been readied for the first chill, and neighbors' houses are just visible through the tree-tops.

It is a powerful image that continues to draw more and more people into previously unpopulated areas of the country. But while the appeal of living close to nature is obvious, the risks of doing so are less clear.

In recent years, images of raging wildfires have been impossible to ignore: panicked residents fleeing their homes with only moments to spare, communities shrouded in smoke and ash for days on end, exhausted firefighters putting themselves in harm's way to protect lives and property.

Yet in the last decade there have not been more fires started or acres burned than usual. Fires have always burned in the wilderness and always will. What has changed is the degree to which people are affected by them. And as populations continue to shift from urban to rural lands, wildfires will likely pose even greater risks in the future.

FEMA developed this initiative as a way to document some of the best, most innovative fire mitigation practices currently underway in the wildland/urban interface. We visited several states in the interior West and talked to people from all walks of life. What follows are their stories, with a focus

on challenges faced, obstacles overcome and lessons learned.

By showing specific instances where people are working together to pursue meaningful change, our goal is to inspire others to do the same. The individuals featured in these stories share a desire to lessen wildfire threats in their communities, but they also share the knowledge that progress often comes slowly. For every success there is a setback, and for every satisfying end there is a humble beginning.

Still, in countless places and in countless ways, they are making a difference.

We have not sought to take sides on the more contentious debates or to promote certain practices over others. In telling these stories, we simply hope to provide a starting point for others who might one day take a similar journey.

While there are no one-size-fits-all prescriptions for wildfire safety, successful mitigation efforts share common elements: reaching across jurisdictional lines, building community support, accepting personal responsibility, and maintaining sufficient reserves of flexibility, creativity and patience.

There can be little doubt that people will continue to seek out the beauty and tranquility of natural settings in which to live. There can be equally little doubt that fire will one day intrude. It is not a question of if, but when and where.

The good news is that mitigation offers a way for communities to more peacefully co-exist with fire—and for residents to be truly at home in the woods.

— Michael D. Brown



Michael D. Brown,
Under Secretary of the
Department of Homeland
Security for Emergency
Preparedness & Response



Wildfire Web Site a ‘Hit’ for Homeowners

Colorado Springs residents go online to find fire rating

IT'S A CITY SYNONYMOUS WITH PIKES PEAK, whose breathtaking views inspired a visiting professor of literature by the name of Kathryn Lee Bates to pen the words to “America the Beautiful” nearly a century ago.

Colorado Springs’ legendary grandeur has always drawn people attracted to its natural beauty and healthy climate. On a typical June day, a steady stream of vehicles makes its way to the 14,110-foot summit of “America’s mountain,” where tourists step from their cars to take in this top-of-the-world panorama.

But in June 2002, traffic on the Pikes Peak Highway slowed to a trickle, and the region’s purple mountain majesty gave way to a more sinister hue.

A raging forest fire burned just 20 or so miles northwest of town. The Hayman Fire, named after a mining ghost town in the nearby Pike National Forest, would eventually cover 137,000 acres, making it the largest wildfire in the history of the state. A banner headline in the Colorado Springs Gazette proclaimed “Colorado Burning!” Thousands of residents in three counties bordering the national forest would be ordered to evacuate. And while flames never directly threatened city residents, fire had left its calling card.

One year earlier, a vision

It was the kind of sight that Fire Chief Manuel Navarro of the Colorado Springs Fire Department had seen before and one that he anticipated with dread and preparation.

A veteran of the 1991 Oakland Hills Fire in California that killed 25 and destroyed more than 3,300 homes, Navarro came to Colorado in 1994. The state was then experiencing a relatively wet phase. But by 2000, Colorado’s woodlands were so dry that wildfires destroyed a record 21,527 acres. In 2001, only moderate fire activity occurred despite tinder-dry conditions and sizzling summer heat.

Chief Navarro sat back in his office chair at CSFD Headquarters and talked about the



Colorado Springs Fire Chief Manuel Navarro

looming threat of wildfires. Outside, beyond the broad boulevards and busy city streets, the iconic profile of Pikes Peak stood out against a brilliant, almost blinding blue backdrop.

Navarro’s eyes took on a faraway look.

“I can tell you unabashedly that it’s going to happen. It’s not a question of *if*, but *when*.”

Navarro was concerned about the growing threat in an area the fire department refers to as the “red zone.” Also known as the wildland/urban interface, this is an area of mixed use where development encroaches on the forested hills west of town. Nearly 45,000 Colorado Springs homes are located in this high-risk environment.

When asked about the Oakland fires, Navarro passed a finger over his furrowed brow. His raspy voice betrayed a hint of weariness in having to go over the painful events of ten years ago—yet one more time.



From vision, commitment

Enter Bill Mills.

As a 33-year veteran of the fire service, Mills knows the drill. With his breezy speech and jaunty manner, “Old Fireman Bill,” as he sometimes refers to himself, combines the evangelist’s fervor when preaching the mitigation gospel with the cynic’s cold eye to just how difficult it can be to change human behavior.

Attired in his crisp dress blues, Mills plays the part effortlessly, making the jargon-laden terminology of the fire expert sound like folk wisdom, smart and funny at the same time. Scratch the surface, though, and you’ll find Mills’ belief in the importance of his mission is bedrock.

Mills likes to joke about his roundabout speaking style. (“I usually have to walk around back to find the barn door.”) Ask Navarro, though, and the chief will tell you that Mills is focused, passionate and relentless.

In the summer of 2001, Mills stood on the observation deck of the Will Rogers Memorial, which is perched on the side of Cheyenne Mountain in the shadow of Pikes Peak. From this lofty 8,000-foot viewpoint, he extended his arm over the entire sweep of the city’s wildland interface—“my area of concern”—a 64-square-mile expanse that is bigger than Los Angeles if you include jurisdictions where the department has mutual aid agreements.

“What you see here is the scope of what we believe to be the largest ground-level residential risk-assessment ever conducted in this country—more than 44,000 homes and businesses,” he said.

North and south, roads snake through foothills, where shingled rooftops peak over the tips of Ponderosa pines. Mills pointed north to a cluster of residences nestled on a tree-topped mesa. He had been working with a homeowners’ association to get the neighbors to create defensible space on their property.

Colorado Springs Fire Department Wildland Risk Management Officer Bill Mills at the Will Rogers Memorial above Colorado Springs, his 64-square-mile “area of concern.”

“The Oakland fires were interesting in a number of ways,” he said. “Twenty years before, that same area was hit, but we were saved by a change in the weather and only 20 homes were lost.”

Navarro paused before adding, “Next time we weren’t so lucky.

“The conditions here in the Springs really concern me. In some ways, this is potentially worse than Oakland,” he said. “When I came here, I vowed that I would never stand in front of a group as I did in Oakland, and listen to residents one after another say that the fire department never informed them of the wildfire danger.”

His vision—some would call it a pipe dream—was to affect nothing short of a wholesale change in the way the local community looks at wildfire threat. It would require deft political skills, formidable powers of public persuasion and sheer doggedness to navigate the “spider web” of competing interests, conflicting authorities and overlapping jurisdictions to get the job done.

“What’s needed is nothing less than a paradigm shift in the way people view living with fire, and their responsibilities to protect themselves and others,” Navarro said.

The new chief quickly learned he was starting from scratch. “I saw right away that we had to do something, so we bit the bullet under a tight budget and created a payroll slot for a person to direct our wildfire mitigation effort.”

Navarro turned to an old hand who had a reputation for fixing things to become the department’s first Wildland Risk Management Officer.

Although he was pleased with the progress made with the group so far, he made a droll confession that all of his outreach efforts haven't met with the same success.

"After preaching mitigation to a lot of empty seats in libraries and church basements, the thought occurred to me that my audience was probably at home sitting in front of a computer. That's when it hit me. We'd put the results of our risk assessment—along with all our other wildfire mitigation information—on the Internet."

The Web site would serve as an accurate and authoritative gauge of the community's exposure to fire danger. Mills thought that by highlighting ratings for every property, he could educate individuals and stimulate action. It would enable people to look up their own address to see how they stack up on a color-coded scale, and take action to get their rating changed.

"We're practicing emergency management here," he said. "We'll take our best knowledge and science, present it to policymakers and bottom-line types in a user-friendly format and ask, 'Where do you want to be with this?' If they're not committed, then we can put it on the shelf next to plans for grasshopper invasions and such."

Commitment to a plan

The basic ingredients for creating an interactive Web site were already in place: the daunting door-to-door assessment, which had begun in 1999, was moving toward completion; much of the Geographic Information Systems (GIS) data needed to chart the map could be borrowed from existing information already found in other city departments such as public works and planning; and the fire department already had a GIS specialist who could lend expertise in putting the pieces together.

The challenge lay in committing time, money and resources to complete the survey, and then to design and market the site. Again, Mills was not breaking ground, but

merely adding value to his master mitigation plan with the addition of an online fire map. In the end, the interactive map would become the centerpiece of the department's Firewise Web site.

"We had to sell people on the overall project, using science and not just sound bites," he said. "We had a broad vision of how mitigation practices could be implemented throughout the community, through public outreach that included the Web site, through vegetation management, code development, ordinances... but also through partnerships with foresters, environmentalists, wildlife managers and utility companies. We didn't just rush out to buy a chipper so we could start clearing trees.

"This is not a cookbook. Planning and getting buy-in from others is hard. There's no way you can do this without feeling pain. Getting results is the fun part."

In the spirit of partnership, Mills helped others who needed his expertise to further their own goals, and shared in their success. When the U. S. Forest Service looked for worthwhile thinning projects, Mills proposed creating defensible space around the historic Cheyenne Mountain Zoo on the western edge of the city, while lending his public information and mitigation planning skills to the zoo on behalf of the fire department. Later, when the insurance industry worked to get a roofing ordinance passed in the Springs as a protection against rising hail-damage claims, Mills pitched in on the department's behalf—the new materials also carry a high fire-resistant rating.

"Once you're able to enlist broad support and assemble a team, you become pretty potent," Mills remarked.

On the basis of a comprehensive 48-page plan and solid partnerships, the department was awarded a \$129,732 Assistance to Firefighters Grant from the Federal Emergency Management Agency/U.S. Fire Administration in 2001. Together with \$55,600 in matching funds from the

city of Colorado Springs, Mills was able to hire a full-time Firewise coordinator, Cathy Prudhomme. In addition to being knowledgeable about fire programs, Prudhomme brought excellent community relations skills and public relations savvy to the job.

At the beginning of 2002, Mills had reason to feel good about the progress of the mitigation plan. He had a strong team and enough financial support to carry him through the coming year. He had gained the support of his chief and city government,

and local, state and federal partners were engaged in their own ways of furthering the prevention plan.

Yet two nagging questions remained. First, there was the perennial question of how to get individuals to take responsibility for reducing their fire danger. Would the Web site really make a difference in motivating people?

A second, more troubling question remained. What would the new fire season bring? And would a damaging wildfire strike before the department had posted its risk map, warning residents of the potentially dangerous situation? From the looks of things, “Old Fireman Bill” had plenty of reason to worry.

June 8, 2002: The Hayman Fire

As the 2002 wildfire season drew near, Mills was hardly alone in his concern. Extreme springtime fire conditions developing in the wooded foothills outside of town foreshadowed catastrophic summertime conflagrations. Colorado was in the midst of one of its worst droughts in recorded history. Ground vegetation in much of the state had moisture content of 1 percent to 4 percent, and big timber was said to be drier than kiln-treated two-by-fours found in a lumberyard.

Topping it off, the legacy of a century of effective fire suppression had created forests that, to Mills’ trained eye, looked like huge stands of undampened matchsticks ready to ignite. The prospect of a raging wildfire devastating Colorado Springs on Mills’ watch made the “old fireman” anxious indeed.

In mid-April, the governor of Colorado warned citizens of the severe fire season ahead. Already the year’s fire activity outpaced the acreage consumed in the catastrophic 2000 season. For anyone who was paying attention, the signs were there, but in the minds of people in the fire service, all the warning flags waved ominously red, orange and yellow.

A quiet section of the Hayman Fire



“When I came here, I vowed that I would never stand in front of a group... and listen to residents one after another say that the fire department never informed them of the wildfire danger.”

— Manuel Navarro

Mills had seen the threat coming far back in winter. He had stepped up work on the Web site for the first quarter of the year, realizing that an active fire season presented an opportunity to encourage homeowners in the wildland/urban interface to take preventative action. When larger fires with names such as Black Mountain, Snaking, Schoonover and Iron Mountain flared in May and June—and the number of homes lost in these fires approached 100—Mills and his team raced to launch the site.

At about 4 p.m. on the afternoon of June 8, a plume of smoke rose northwest of town in the Pike National Forest. Under the watchful eye of the U. S. Forest Service, the fire’s flames laid down some during the night. But next morning—an otherwise quiet Sunday morning—the fire simply exploded, sending smoke spiraling upward with a monstrous heat-induced fury until a huge mushroom cloud emerged full-blown above the jagged line of the Rockies.

In just 24 hours, the Hayman Fire grew to become the largest wildfire in Colorado history. Ultimately, it would take 21 days to contain the blaze, and only after it had destroyed 133 homes, covered 214 square miles, and forced the evacuation of more than 8,000 residents, most of them from the outermost suburbs of Denver to the north.

For weeks, wildfires would dominate the news in Colorado Springs. At first, feathery, ashen fallout floated for miles on waves of superheated winds off the mountainsides. A telltale odor hung in the air. Then dust stole into homes, leaving a whitish layer of film on surfaces everywhere. People were seen walking the downtown streets with handkerchiefs covering their mouths, while others complained of a sick feeling in the pit of their stomachs. The red and orange hues of sunset served as daily reminders that the powerful forces of wildfire were still on the loose.

To Mills’ way of thinking, the shroud of smoke that cloaked Colorado Springs for

nearly a month was a kind of advertising campaign for the mitigation message. He was determined to capitalize on it.

“In a strange way, it all seemed to come together. The Hayman presented us with a tremendous teaching opportunity. The community would be our outdoor classroom. And the Web site would be our adult education tool,” Mills said.

David Blankenship, the department’s senior GIS analyst, redoubled his efforts, working 16-hour shifts in an all-out drive to the finish. More and more, Mills and Prudhomme found themselves at their phones. Suddenly there was demand to learn more about fire mitigation.

“People were forced to think about the danger, and they had never been in that position before,” said Mills. “This one hit home.”

The city’s Web-based wildland fire map was launched June 12, just four days after the Hayman first flared. As part of the department’s official kick-off, local media and city council members joined the public in looking up their addresses online to find their fire rating. The reception was both exciting and gratifying. It was a big day for Navarro, Mills, Prudhomme and for the rest of the mitigation team.

Next day, the mitigation office buzzed like a pizza parlor on Super Bowl Sunday, with phones ringing off the hook. Residents had looked up their property and were eager for more information or advice. For the next month or so, the site averaged 500 hits a day. More than 100 homeowners took action and came back to the department to get their rating upgraded on the Web site map.

In their phone conversations, e-mails and comments at community meetings, residents were “talking the talk,” using terms such as “defensible space,” “fuel load” and “risk-assessment rating.”

The mitigation message was finally sinking in, and Mills savored the moment.

“Listening to them talk mitigation, to me it was sweet music.”

“One of the smartest things we did was to enlist the media in helping us get the message out.”

— Cathy Prudhomme

Lessons learned

By December 2002, six months after the Hayman Fire, Mills and Prudhomme could still be found busily at work. The mitigation office was a two-person shop, with GIS specialist Blankenship called in from time to time to update the Web site. Understandably, hits on the site had slowed to a trickle. Still, there were a handful of mitigation projects on the books to keep the work flowing.

And it was no time to become complacent. The department was concerned about the 2003 fire season, which was shaping up to be every bit as bad as the previous year's. Besides, given the rate of growth and residential turnover in the Springs, they knew there was always a new audience for their message.

When asked about some of the lessons learned from the Web site launch, a few thoughts came to mind.

“One of the smartest things we did was to enlist the media in helping us get the message out. With their interest and support, we were able to save money we thought we'd need to spend on marketing, and put it toward more public outreach,” Prudhomme said. “Coverage was so effective that I believe we would have had a good response from the public, Hayman or no Hayman.

“Another pleasant surprise has been the willingness on the part of many individuals to champion the cause,” Prudhomme continued. “When people called in to talk about their risk, they often mentioned the danger level for the entire neighborhood. We invited them—you might even say that we brow-beat them—to organize a neighborhood meeting, and many times they did. Don't underestimate people's willingness to help.”

One of those willing to step forward was Baaron Pittenger, a resident of Broadmoor Bluffs at the base of Cheyenne Mountain. Pittenger attended a neighborhood meeting hosted by Mills after, in his own words, “the Hayman Fire significantly raised my awareness level.”

What he learned at the meeting—information later confirmed by the online fire map—was that his home and all those in the surrounding neighborhood were rated as being in “extreme” risk of wildfire. Previously, Pittenger admitted, he had no idea that he was living in such a high-risk zone.

This realization inspired Pittenger, a former executive with the U.S. Olympic Committee, to do something meaningful for the community. He began organizing a non-profit group to promote fire mitigation and give citizens a voice in how they want to deal with the increasing threat of wildfire to their community.

“Baaron Pittenger is an outstanding example of someone who has taken individual responsibility. Not only that, he's become a strong advocate for community-wide wildfire mitigation,” said Prudhomme.

She also remarked on an interesting social phenomenon. It seemed that people who looked up their home parcel also made note of how the rest of the neighborhood rates.

“Call it pride, or call it social pressure, but most people don't want to be the only ‘hot spot’ in the neighborhood,” she said.

Prudhomme has found that she sometimes has to reassure homeowners that their color code is not going to be used by insurance companies to raise rates, a common concern. She explains that these worries are groundless, since companies base their rates on actual losses, and instead encourages homeowners to take steps to reduce their risk and promote the changes as a positive.

Mills found a rise in attendance and in the level of awareness at public meetings, which he attributes in large part to the Web site.

“People are doing their homework. When the fire service speaks at these occasions, we're able to download visuals from the Web site, and give people an accurate picture of how the neighborhood is managing its risk, and we have a much higher level of discussion about what needs to be done,” he said.

“I also learned that you can only push people so far before they resist your efforts. They have to come to you. By making our map detailed to the level of the individual homeowner, we gave people a reason to come to us when they were ready to come to us,” Mills said.

Mills advised others engaged in the mitigation effort to share their success. In November 2002, the fire department learned that it had received special national recognition from the U.S. Fire Administration for the department’s effective use of its 2001 grant. Based in part on the success of the Web site, the city council voted to fund the mitigation team for the coming year.

“Others may learn from what you were able to achieve, and it gives your program credibility with local officials and the community,” he said.

Last, but not least, Mills cited the unwavering support of his department as a major reason for the team’s success. “Chief Navarro has always stood behind our efforts, and my immediate boss, Fire Marshall Brett Lacey, has worked with us every step of the way to make sure that wildfire mitigation is an important part of the department’s mission.”

But challenges lay ahead. With across-the-board cuts in city government, resources were especially tight. In recent weeks, Mills and Prudhomme had begun keeping a list of callers who have taken mitigation action and would like their rating re-evaluated. Due to staff limitations, they will plan to put on a different hat and personally make the inspections at the beginning of the new year.

According to Mills, it’s a constant battle to tilt the odds a little more in favor of community safety, and it’s not always easy to know where your effort stands. But he keeps at it.

“You’d be surprised at the number of people who are willing to ‘take knife in teeth’ and join us in the fight to make the community a better place once you give them a sense of the important role they play in the effort,” he said. ■



How the Online Fire Map Works

THE ONLINE MAP is located on the Colorado Springs Fire Department's Firewise Web site at <http://csfd.springsgov.com>. The map provides homeowners with a wildfire risk rating of individual properties and overall scores for their neighborhoods. To find their wildfire risk level, homeowners simply click on the "What Is My Wildfire Hazard Rating?" icon and then click on the search button to enter their street number.

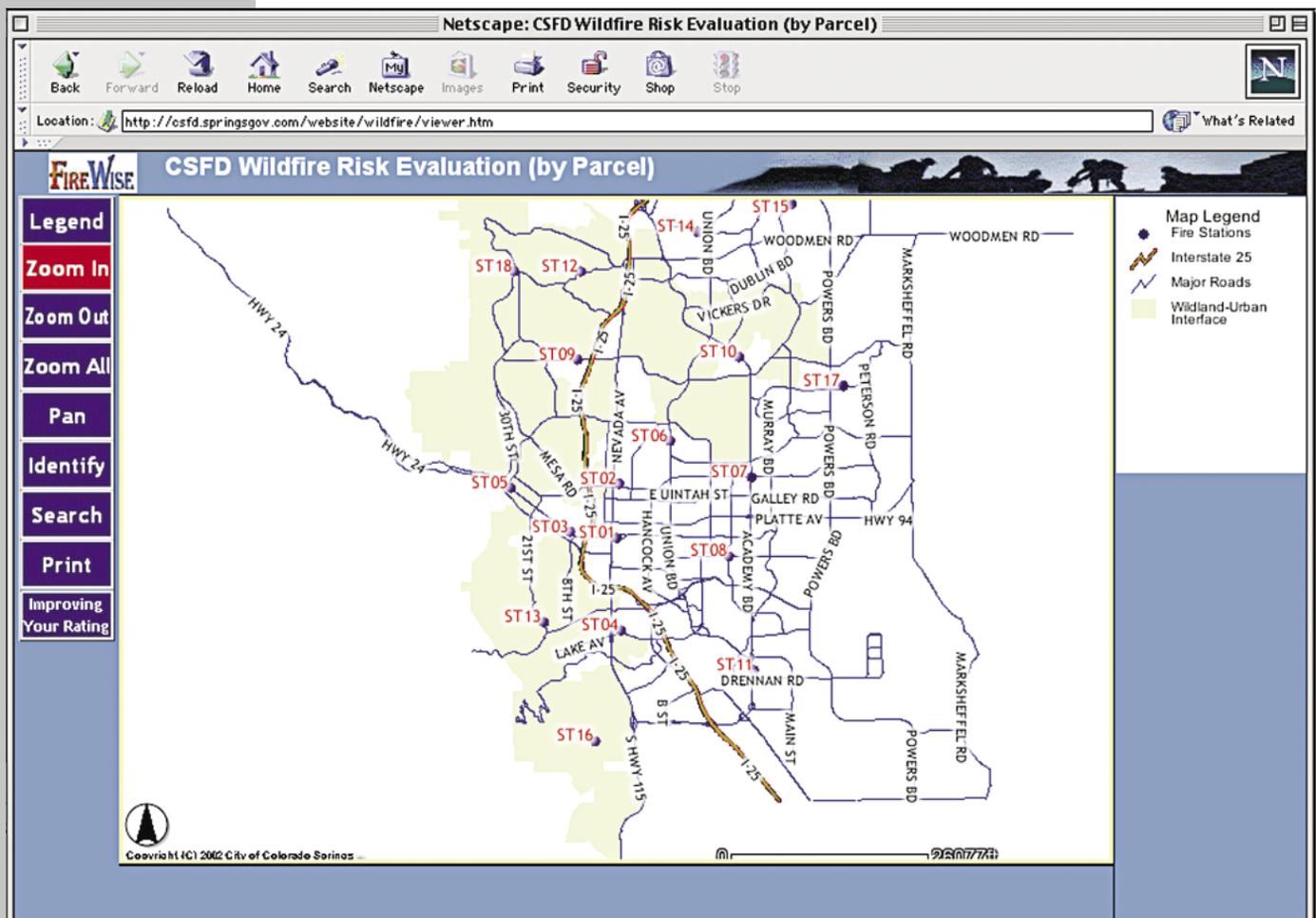
Abbreviations are not necessary. The search can be easily accomplished by typing in the street number followed by a space and the first letter of the street name. From the list of matching records, homeowners select their address or enter by clicking directly on the city map in the area close

to their neighborhood. Specific parcels are located by using the zoom-in feature.

Houses are rated red, orange, yellow or green. Green indicates the lowest hazard rating, and risk increases as the colors progressively get closer to red.

Information to assist homeowners reduce their wildfire risk is available by clicking on the "Improve Your Hazard Rating" icon from any page. Vegetation management techniques are also provided on the site.

When recommended mitigation improvements are completed, homeowners may schedule a new evaluation. On the Firewise homepage listed above, homeowners can click on "Contact Us" or "Receive a New Rating" to find out how their ratings can be upgraded on the map. ■



How to Put Together a Successful Mitigation Meeting

More about the
Colorado Springs
Web site

MILLS AND PRUDHOMME offer the following useful tips for people who would like to organize a meeting in their community:

- ✓ When hosting or sponsoring a meeting, your presentation can be limited to distributing informational flyers or hand-outs, or as ambitious as asking others to “champion” the effort to reduce the wildfire risk.
- ✓ Consider holding the meeting when other major events won’t present a conflict, and as close to the last publicized fire as possible. Snow has an amazing ability to redirect people’s focus.
- ✓ Hold the meeting at a central location and at a convenient time. Locations can range from an individual’s home, driveway or cul-de-sac, to churches, schools, and fire station community rooms. Take a poll among those who would like to attend to figure out the best times. Use a facility that can provide or accommodate food and beverage.
- ✓ Send invitations or call every homeowners’ association in your wildland/urban interface with an offer to inform homeowners of methods to reduce their wildfire risk.
- ✓ Prior to the meeting, get an idea of who will be represented and prepare to give information that is relevant and useful. Discuss both short- and long-range goals.
 - Short-range project goals may include: cleaning needles and debris from gutters, mowing grasses away from the house, displaying an address sign, and pruning trees and shrubs away from home foundations.
 - Long-range goals may include: developing defensible space, re-roofing the home with noncombustible roofing material; and in some instances, developing community water supplies (usually cisterns or dry hydrants) and community fuel breaks (larger fuel treatment areas that protect multiple structures).
- ✓ Explain that efforts to make individual homes safer from wildfires make a great start, but for mitigation to be really effective, it requires a neighborhood endeavor. Briefly explain how wildfire mitigation is most effective when adjacent property owners put forth the same effort. Encourage other homeowners to host or sponsor a neighborhood or community meeting.
- ✓ Use of case studies often allows people to examine the fire problem from various perspectives. The firefighter’s viewpoint alone is usually insufficient. Always invite the local fire chief to present the realities of the department’s fire protection capabilities. Consider having additional speakers attend such as local and state forest service representatives, county emergency management personnel, and county or municipal planning representatives.
- ✓ Identify representatives from other departments and organizations who are the appropriate entity to address specific local problems. Individuals often want to deviate from fire and fire safety to discuss topics such as forest health and agency policy arenas. It’s a good idea to have knowledgeable people from related areas on hand to lend their expertise.
- ✓ Challenge attendees to hold neighborhood work days and share rental costs for dumpsters and chippers to remove unwanted trees, brush, and debris generated during clean-up activities. If you make people aware of how actions will directly benefit them, they will often be motivated to organize a group effort.
- ✓ Meetings should be linked to future plans and actions. Even if the initial meeting is only informational, it is always beneficial to have follow-up meetings scheduled. For additional gatherings, develop community-sponsored events such as slash pickup, pile burning (a controversial practice that has limited applicability), and community-based public awareness efforts to reduce costs to the individual homeowner.
- ✓ For those who would like additional support, the Colorado State Forest Service can help organize local Firewise workshops in Colorado. Outside of Colorado, please contact the national Firewise group by logging onto www.firewise.org. ■

Community Chips Away at Wildfire Mitigation

Sundance changes culture along with landscape

THIS IS A STORY ABOUT A COMMUNITY in the wildland/urban interface that took a long look at its wildfire risk and decided to do something about it. But where such a story usually begins with a wake-up call in the form of a catastrophic fire, in Sundance, Utah, the process began with a simple meeting.

In August 1998, a handful of residents came together with state and local fire managers in a community fire forum. Joining them were fire experts from across the United States, as well as a facilitator to keep the discussions on track.

One of the meeting participants was Jack Cohen, a scientist with the U.S. Forest Service in Missoula, Montana, who has continued to consult with the community. He saw right away that Sundance faced significant challenges.

“I conducted a quick assessment of the community and identified a number of ignition factors needing mitigation,” he said.

The experts walked the attendees through a process designed to establish a long-term fire mitigation plan, and everyone was left with a lengthy list of things to do. The daylong meeting went well, but as one participant later recalled, “That’s always the easy part. Then what do you do?”

In Sundance they kept meeting, once a month, and soon they were joined by representatives from the Utah Division of Forestry, Fire and State Lands and other agencies. Eight months later, after sharing a draft with area stakeholders, the group emerged with the North Fork Wildfire Plan, which continues to guide Sundance on its journey toward sustainable, communitywide wildfire mitigation.

‘A mixture of old and new’

Sundance sits in the north fork of Provo Canyon, about 45 miles south of Salt Lake City. Towering above Sundance is 12,000-foot Mount Timpanogos. Surrounding the town are forests where aspen, conifer and oak-

brush vie for supremacy and an occasional meadow opens to a view of the mountains. During the winter, snow covers the area and it becomes a popular ski destination.

Like many resort communities, Sundance has a mix of full- and part-time inhabitants, though the number of residential water hook-ups, 350, is far greater than the number of full-time adult residents, 70. Still, there are 11 different homeowner associations, and Sundance remains unincorporated under the jurisdiction of the North Fork Special Service District.

Alpine Loop Road runs through the heart of Sundance and connects to the side roads that twist high into the canyon where small cottages and multi-million dollar homes sit artfully concealed. Follow Alpine Loop Road to the crestline and Sundance gives way to U.S. Forest Service land.

Actor and director Robert Redford bought much of what today comprises Sundance in 1969 and his Sundance Resort rests at the base of the canyon, welcoming visitors. Across the street is the volunteer fire department that was built on land he donated. Redford has described Sundance as “a mixture of old and new, lush and spare, sophisticated and primitive,” and he continues to make a home there.

An occasional fire down in the valley will send smoke up the canyon toward Sundance, giving residents a scare, but the community itself hasn’t had a major burn in more than a century. While a wildfire didn’t drive people to participate in the August 1998 meeting, other factors did.

‘A long, slow process’

Kathy Hammons attended the meeting and was the first chair of the ad hoc committee that formed in its aftermath. She credited the people who moved to Sundance from other at-risk communities for bringing a new perspective.

“I was raised in California where wildfires are common and a firefighting infrastructure

Sundance resident
Kathy Hammons



is taken for granted,” Hammons said. “The population in Utah is just starting to sprawl into the more fire-prone areas, and many new people coming in understood that we were in a pretty bad situation.”

At the time of the meeting, residents had also recently been warned by state foresters that Sundance and the other communities along Utah’s Wasatch Front were extremely vulnerable to fire. Against this backdrop, and with the support of Redford and other community leaders, a fire forum was put together.

Over the years Sundance had built one of the best volunteer fire departments in the state while also working to mitigate its fire risks. For example, residents have long performed “bridge watch,” which involves stopping cars on busy holiday weekends to

pass out fire-safety literature. And in the early 1990s, strict ordinances went into effect throughout Utah County, which includes Sundance, calling for wildfire-oriented building and defensible space on any new construction.

But it wasn’t until the fire forum that a coordinated, comprehensive approach to wildfire mitigation began to emerge and some longstanding paradigms began to change.

“It has been a long, slow process,” said Tom Wroe, Utah County fire marshal since 1987 and 34-year veteran of firefighting. “The dynamics of this community are different than in other parts of the country. People buy land here and move here because they want to get away. It’s a place they come to for solitude. It’s a great place to play.



Sundance homes in the interface

“But there is a lot of work that needs to be done when you buy a mountain property.”

Two of the biggest challenges facing the fire forum were finding a way to involve part-time residents in the community effort and overcoming resistance from those opposed to changing the natural look of the area. So as the participants left that first meeting, there was a high degree of motivation, a mountain of work—and a few surprises.

“We started by forming an ad hoc committee, and we thought we would have to put this whole thing together and shop it,” Hammons said. “But it went the other way. The agency representatives wanted to come to the table with us, and that just shocked us. We had no idea that they would want to be part of this.”

Hammons also discovered that the mere act of planning produced results. “What we found through the planning process is that once you sit down and start, you are immediately forming committees that are action-oriented. So even though it might take awhile to finish the plan, the committees will still be moving forward.”

‘It started clicking’

Today the North Fork Fire and Safety Advisory Council is the focal point of the community’s wildfire mitigation efforts, anchored by a wildfire plan that continues to evolve. Stew Olsen, a lifelong resident of Sundance and a member of the family that originally settled the canyon, was chair of the North Fork Special Service District Board for several years and saw the council go through distinct phases.

A major change occurred when the original ad hoc committee became an advisory council under the special service district board. “Even early on it was clear that the district had to be involved on an active level, since it is the only government in Sundance,” Olsen said. “And since the

district is also in charge of the volunteer fire department, it was an opportunity to join the government and community together.”

A second change occurred in 2002. For the first time, the board voted—unanimously—to begin assessing for specific fire mitigation activities, such as removing excess fuels, educating the public and developing evacuation plans. The board even voted to buy a chipper. And Olsen said there was no real opposition. “People don’t like to pay for things, but when they see houses starting to burn...”

The assessments have provided something else, too. There is now paid clerical support for the advisory council and committee members—all volunteers—who do much of the day-to-day work.

From the beginning, the ad hoc committee proved adept at generating outside financial support for its activities.

“We brought in a \$28,000 grant the first year and put it into a demonstration project that showed a lot of people what we could do,” Hammons said. “The next year we received \$190,000 under the National Fire Plan to continue our work.” The required 50-50 match for the grants was paid through sweat-equity.

As of February 2002, in-kind donations of labor, services, supplies and equipment amounted to more than \$250,000. For example, in 2000, 2001 and 2002, Brigham Young University—which operates the Aspen Grove Family Camp in the canyon—brought in hundreds of volunteers to spend half a day clearing out dangerous fire fuels. Each visit netted the community some \$35,000 as an in-kind donation.

“When I first started it was always, ‘But we don’t have any money...’” Hammons said. “Now people are seeing that they can bring in money just by cleaning out their property or changing their roof—by doing what will make them safer anyway. All of a sudden, it started clicking that we could do this.”

To Wroe, it is important for communities to realize what can be accomplished without regard to financial circumstances.

“There has never been the emphasis that you must have a big wallet,” said the county fire marshal. “Any community can pull its people together, organize and come up with a plan.”

Jim Shell works for the U.S. Forest Service and recently took over managing the programs that deliver National Fire Plan dollars to states. Prior to relocating to Washington, D.C., Shell spent 12 years with the forest service in Ogden, Utah. From there, he watched and encouraged Sundance as it worked to address the hazards facing the community.

“Sundance has had strong leadership,” he said. “I know they benefited from the support of the National Fire Plan, but they were already on a good course of action. Sundance has been working at this for quite awhile, and it was one of the first communities in Utah to see the need.

“Support from the National Fire Plan may not always be there. Our hope is that a couple years of funding can help people figure out how to work together—that would be the big gain of this effort. Success comes from people who realize they have a need or a problem and then carry the ball.”

‘One bite at a time’

A look at the wildfire projects undertaken in Sundance since 1998 reflects the depth and breadth of the commitment. Some of the projects include: annual evacuation meetings with emergency responders; collaborative re-roofing projects; free mobile chipping; annual clean-up days; fuel reductions along major ingress/egress routes; individual property assessments by wildfire experts; installation of non-flammable street signs; purchase of emergency sirens; and publication of a monthly newsletter, called *Fireline*.

Equally impressive is the number of people who have pitched in to make a difference. More than 100 individuals have been

Sundance Safety
Officer Kenny Johnson





Utah County Fire
Marshall Tom Wroe

recognized by the advisory council for their contributions — ranging from monetary donations and volunteer committee assignments to property cleanup and community-wide assistance.

To firefighting professionals like Kenny Johnson, who is the safety officer for the Sundance Resort and assistant fire chief of the volunteer fire department, one of the most important elements of the effort is that it has been initiated and led by the community itself.

“We are there as a professional resource, to provide information regarding fire suppression and what needs to be done as far as fuel reduction and awareness,” he said. “But we try not to say, ‘You have to do this.’ If it comes to people from their neighbors or their community, I think it is more effective. The paid professionals can speak all they want, but if the community is not involved it won’t matter.”

Both Johnson and Wroe regularly attend meetings of the fire advisory council to offer input and support.

It can also be beneficial to focus on the small steps that add up to meaningful change. “In the beginning, start small,” Johnson said. “Send out a newsletter and raise the level of

awareness. Then take on larger projects and issues. It will snowball from there.” Wroe said he thinks of it as an “elephant dinner—just take one bite at a time.”

Hammons said it is just as important to be patient. “What we have learned is that people do a little bit every year,” she said. “Giving them stages has worked very well here. The key is getting everyone to participate to the level they can at that particular time. And then letting it take as much time as it needs to take, but to keep it moving.” For example, it took Sundance three years to agree on a plan for installing street signs.

While connecting part-time residents to the community continues to be a challenge, there are signs of progress—such as the lack of opposition to the assessments, which could be an indication that residents have come to rely on the services provided by the district board and advisory council.

“This is the first thing in Sundance that has been able to bring the different groups together,” Hammons said. “Wildfire crosses all denominators.”

Hammons has seen the culture change in other ways, too. “About 10 years ago, a homeowner installed a metal roof and the roof was above the tree line, so everyone could see it,” she said. “The community was absolutely appalled. Now it is a great example of visionary thinking. We’ve shown that it is possible to have very different roofing and landscaping looks and still meet safety standards.”

When Sundance homeowner David Heaps re-landscaped he had two goals—lessen fire danger by clearing dangerous foliage away from the house while maintaining core aesthetic qualities.

“We wanted to push the natural stuff back a little but we didn’t want to encroach on it too much, because the natural habitat is why we’re here,” he said. “I think it’s obvious that if everybody does their part, the whole becomes stronger.” He also installed rock barriers, put in fire retardant vegetation and added a sprinkler system.

“By developing the plan in true collaboration with the community and agency partners, you’ve always got people who want to maintain it.”

— Kathy Hammons

Julie Mack, who heads the North Fork Preservation Association, said that wildfire mitigation and environmentalism should not be seen as mutually exclusive. “We are practicing forestry ecology,” she said. “Since we are at such high risk for fire, thinning the forest and improving the health of the ecosystem makes it safer for homeowners and makes it better for the environment.”

‘Standing in Mother Nature’s shoes’

In many ways, the work in Sundance is a never-ending job that is only just beginning. Maintaining what has already been done is a huge project in itself, as is the ongoing effort to reach homeowners who have yet to embrace mitigation. And there are remaining concerns—such as planning for a large-scale evacuation. On a summer day, more than 7,000 people could be in the canyon, with limited egress.

Sundance could also be tested as early organizers and supporters give way to other volunteers. Hammons now spends much of her time helping other communities in Utah

prepare for wildfire, and Olsen stepped down as chair of the special service district board at the end of 2002, though he remains on the board. But Hammons is confident that the wildfire plan adopted after the August 1998 meeting will ensure longevity and sustainability and that the torch will continue to be passed.

“That’s why you anchor to planning — whoever comes and goes, the plan is still there,” she said. “By developing the plan in true collaboration with the community and agency partners, you’ve always got people who want to maintain it.”

From Wroe’s perspective, that is an obligation all residents assume when they choose to live in the wildland/urban interface.

“Fire is a natural phenomenon that cleans out the area, allowing the life cycle to start again,” he said. “We don’t need fire if folks are willing to look at the responsibilities they have. They are standing in Mother Nature’s shoes now, and they need to assume that awesome responsibility.” ■

Kenny Johnson
at Sundance Resort



A Community Solution

Dynamic duo spark grassroots wildfire planning

ON A SUMMER DAY, thousands of visitors will make the short drive from Salt Lake City to Big Cottonwood Canyon to enjoy the rugged beauty of the mountains. The 17-mile stretch of Utah Highway 190 runs through the heart of the canyon and climbs east through thick stands of fir, aspen, spruce and pine, with Big Cottonwood Creek meandering alongside.

As one of approximately 500 people who live in Big Cottonwood Canyon year-round, Barbara Cameron has grown accustomed to the many summer visitors who come to the suburban canyon to picnic, camp, hike and bike. But she has had trouble getting used to another change that summer brings—fear of wildfire.

“Every July, August and September things get so tense up here you can feel it crackling in the air,” Cameron said. “We worry about fire until the first snow comes, then there is a collective sigh, even from the trees.”

Like many people who live in the wildland/urban interface, Cameron didn’t know that she could do anything more than spend the summer fearing the worst while hoping for the best—until she attended a Community Solutions wildfire preparation workshop conducted by Kathy Hammons and Janet Johnson.

Hammons and Johnson formed Community Solutions in July 2001 as a way to share their wildfire safety expertise. Hammons has a background in education and was involved in building the community wildfire plan in Sundance, Utah; Johnson worked for the U.S. Forest Service and later helped develop a statewide initiative called Utah Living with Fire.

“After Janet and I worked together to make Sundance the first community model for Utah Living with Fire, the state office of Forestry, Fire and State Lands gave us some seed money to see if we could develop a model that would fit other communities,” Hammons explained.

Since the first training session in October 2001, the state of Utah has contracted with Hammons and Johnson to bring Community Solutions to six additional sites, and so far more than 35 Utah communities have been through the workshops.

Cameron and six of her neighbors from Big Cottonwood Canyon attended a two-day session in October 2001, and they were joined by residents of other nearby communities. “The training was a wake-up call,” she said. “We have a lot of independent-minded people up here, but the wildfire issue galvanized the whole canyon.”

To Hammons and Johnson, finding the right people to attend the workshop is a critical part of the equation. In addition to agency representatives and firefighting professionals, they also want local “spark plugs” like Cameron who can help change a community’s culture.

“We start the process by identifying and training a local technical support person who can invite a good mix of community and agency people,” Hammons said. “During the workshop we look at the tools needed to build a sustainable community wildfire program. The local support person is there afterward to help the communities establish wildfire councils and complete their plans.”

Janet Johnson,
Community Solutions



Based on a combination of research, feedback from communities and work with a facilitator who helped Sundance during its initial fire forum, Hammons and Johnson isolated six basic elements of wildfire planning that form the core of the Community Solutions curriculum: fuel reduction, facilities and equipment, education, emergency response, regulative issues, and evaluation and maintenance.

“We ask everyone, ‘What do you wish you would have done before you smelled the smoke?’ and everything parks within those six areas,” Hammons said. “We have done this enough now where we know that if a community develops a plan that addresses those six areas it will be in pretty good shape.”

In Utah, there is an added incentive for communities to attend the training and develop a community wildfire plan: mitigation funding. According to Larry LeForte, a fire management officer for the Utah Department of Natural Resources, the state uses the training as a way to identify communities where funding from the National Fire Plan will have the most impact.

“We can write a grant specifically for a community based on what is submitted in its fire plan,” LeForte said. “We don’t have the resources to write community fire plans for everybody, and having them write their own and identify their own problems gives them ownership. We’ve found that it’s very difficult to get anything accomplished unless the community buys in.”

After the training the first item of business for the group from Big Cottonwood Canyon was to complete its wildfire plan, and it was then that Cameron recalled thinking, “We can do this.” Since then, the Big Cottonwood Canyon Wildfire Committee has continued to meet monthly—even during winter—and the community has made significant strides.

One particularly notable success was the development of a map that for the first



time provides emergency responders from Salt Lake County with specific addresses and locations of Big Cottonwood Canyon residents. The map is currently being refined to include a Geographic Information Systems (GIS) component and will offer additional emergency response information, such as road conditions, road slopes, turn-around areas, electric shut-off sites and residential contact numbers.

In addition to community fuel reduction projects and the distribution of a newsletter during fire season, the wildfire committee has also been working with the county on planning and zoning issues that affect the canyon. Said Cameron: “For the first time, we feel like we have some input into our own defense.”

Both Johnson and Hammons hope a feeling of empowerment is the greatest legacy of the training. “When people leave the room, I think the first thing they feel is that they can

Big Cottonwood Canyon resident Barbara Cameron

“For the first time, we feel like we have some input into our own defense.”

— Barbara Cameron

do something, rather than that helpless feeling of ‘we don’t even know where to start,’” Johnson said. “Then it snowballs and they want to do more and more as they realize it really is working.”

One of the ways that Hammons and Johnson empower communities is by demonstrating creative approaches to funding wildfire safety initiatives. By focusing on resources rather than money, communities are shown how to supplement direct grant assistance by generating in-kind support like volunteer labor, donated materials and equipment, cash contributions and community partnerships.

In the 10 months after its training, Big Cottonwood Canyon reported more than \$82,000 in in-kind donations, in addition to a \$1,200 grant from the Firewise Communities/USA project for an ArcView software program, which was used to develop the new map. Big Cottonwood Canyon has also applied for a National Fire Plan grant based on its in-kind donations.

Another benefit of the workshops comes from bringing community members together in a forum that promotes communication and support and highlights the power of working as a team. At a training in Brian Head, Utah, in August 2002, residents and agency representatives alike were heartened by the many new faces in the room and hopeful that it signaled an emerging commitment to wildfire mitigation.

“We’ve all been doing what we can for our own properties, but until this meeting we hadn’t come together as a whole to make the community more defensible,” said Peg Simons, a Brian Head homeowner. “I think we will finally be able to take the motivation and put it into motion.”

Brian Head Fire Captain Dave Stolrow was equally optimistic. “I feel like the load is now

being shared and that a lot more is going to be accomplished in a shorter period of time,” he said. “We’re going to have more backing from the community—and if residents develop the plan and are part of it and understand why it’s necessary, it’s going to be one hundred times more effective.”

As they do with all the communities that attend the Community Solutions workshops, Hammons and Johnson will track the program outcomes in Brian Head to measure progress in what promises to be a long journey—and Brian Head has already taken its first step by working to build a fully functional wildfire council.

But the one outcome that is perhaps hardest to measure might be the most important of all. “The primary goal is to change the culture of the communities so they no longer think of this as somebody else’s responsibility,” Hammons said.

To both Hammons and Johnson, that is the ultimate community solution. ■

Six Basic Elements of Fire Planning

- Fuel reduction
- Facilities and equipment
- Education
- Emergency response
- Regulative issues
- Evaluation and maintenance

For more information

regarding Community Solutions, contact Kathy Hammons at (801) 523-3803, Janet Johnson at (435) 657-0668 or e-mail at cmtysolutions@aol.com

Fire Inspires 82-year-old to Thin Trees

AS THE 2002 FIRE SEASON HEATED UP, Christie Kinney's thoughts immediately turned to her land. Then this plucky octogenarian rolled up her sleeves and got to work.

A resident of the forested Elk Ridge subdivision in Routt County, Colorado, Kinney started raking up loose vegetation near her house, a cleanup that she performs with ritual regularity each spring. But when the Hinman Fire spread near her home, she kicked into high gear—thinning, limbing and even serving as a public advocate for defensible space.

Keeping her home protected from wild-fire was harder for Kinney than it is for some. At 82, she has suffered some of the usual infirmities of age. But as an outdoor enthusiast all her life, this old farm girl sounds almost defiant in saying, "I can still run that limb saw."

Efforts motivate others

Kinney said her yard—which covers more than two acres and is steeply sloped in areas—became "brushy" after the death of her husband, Harold, in 1989.

Born in 1920 on a farm in Kansas, Kinney married her high school sweetheart in 1939 and they started their married life on a farm near Topeka. In 1958, they moved with their son and daughter to Longmont, Colorado. Harold spent most of his career helping to make solar observatories as a machinist and tool and die maker in Boulder for the firm now called Ball Aerospace & Technologies Corp.

About 10 years before his retirement, they began to look for a new place to live. They had taken camping trips to Routt County since 1960 and fell in love with the mountain landscape. In 1970 they bought the lot where they built their home.

In pioneering fashion, the Kinneys had a well drilled and installed a septic tank and water lines, then built their log home with their own hands, putting up the garage first so they could live there while they worked on



the house. They started with an asphalt shingle roof, switching to metal when they could get the color they wanted and moved into their new home in the early spring of 1980 with snow still on the ground.

"I love it here," said Kinney, describing her efforts to keep the fire threat down by clearing her property of ground fuels. "That's the reason I worked so hard last summer."

When her husband was alive, she said, he was on the fire board and they worked together to keep the land clear of underbrush. He would fell trees, then she would limb them and load them in a trailer pulled by a tractor.

But after his death, her work to reduce the fuel load consisted mainly of annual raking of leaves, twigs and pine needles. That's how she started in the spring of 2002.

Watching the Hinman Fire from her home provided Kinney with all the motivation she needed to do more. "That's when I started really thinking about it and thinking we should do something around here," she

Christie Kinney and Ginger ready to limb their trees



Chuck Vale, Routt County director of emergency management

said. With two children, seven grandchildren and seven great-grandchildren, she enlisted help from her family, as well as other area residents.

Her daughter from Grand Junction, Colorado, visits each year for a spring cleaning, but in 2002 Kinney asked her to pitch in with yard work instead of doing household chores. They raked even farther from the house than usual, collecting more than 30 bags of leaves. Later, she recruited her son and daughter-in-law to rake even more.

Meanwhile, State Forester Terry Wattles paid her a visit. He sharpened some of her husband's old tools, identified some vegetation and recommended someone to help with its removal.

A contractor cut down more than 30 trees identified by Wattles, while Kinney put her freshly sharpened shears to work on juniper bushes. "I had always avoided them because they're so sticky and make me itch so badly," she said. "Those juniper bushes just really burn hot, I guess."

Kinney remembers the time when Chuck Vale spotted "me and my little limb saw" high in a tree, working to trim some branches. Vale—Routt County's director of emergency management—admired her determination and self-sufficiency while privately fearing for her safety. He graciously offered to lend a hand.

Vale thought that Kinney's actions could serve as an example for all. He said the problem with mitigation is getting people motivated, and he thought Kinney's story might help motivate others. At his request, she contacted local media to tell the story of her efforts to create defensible space. Articles followed in local and statewide newspapers.

"It can't always be the government saying we need to do this and that," Vale said.

Kinney's efforts did help to get others interested in the mitigation cause. Eventually, more than 25 of her neighbors created significant defensible space in their yards, too.

Childhood memories of fire

Kinney said she never liked the prairie grassland fires near her home when she was growing up. "Being a youngster, it scared me," she recalled.

The alarm would come over the telephone, which was a party line.

"With the old switchboards, it was possible for the operator at the central office to open up all the party lines at once out in the county in order to give out an emergency message," she recalled. She remembered the set-up because her grandfather had operated the central phone office in the 1920s before they had electricity. The switchboard had battery-operated lights.

After the call came, her father would hurry to get his wagon with the water tank. She estimated that the big metal tanks used to water the cows held about 500 gallons. Her father would put gunnysacks in the tank so they could soak as he drove the Model T or horse and wagon, usually taking about 30 to 40 minutes to get to the fire. He would have to go through fenced pastures opening gates along the way. Once there, he and the other men would beat the fire out with the soaked gunnysacks.

The women would get together and make sandwiches to bring to the men. "I got to go with them one time," she said.

More work to be done

After all her work, Kinney is pleased with her landscape. "I think it looks beautiful," she said. "I miss the trees, but it's better than the alternative of having too many trees and having them burn."

Next spring, she plans to put her propane tank underground and to take out one healthy tree that could cause problems because of its proximity to the house and other trees. She also hopes her son-in-law will take out some trees that beetles have killed. And she wants to terrace one area so that it will not be so steep.

"I'll shovel it myself if I have to," she said. ■

Fuel Reduction Protects Mesa Verde National Park

CLOSE TO THE FOUR CORNERS REGION of southwestern Colorado, an 8,000-foot-high mesa is home to Pueblo ancestral dwellings that have lined the canyon alcoves for more than 800 years.

From a distance, the largest stone complex, Cliff Palace, resembles a ruined fortress of towers, ramparts and windows lodged inside a massive oval cavern. Considered a masterpiece of architectural ingenuity with its plazas, 150 rooms and 21 ceremonial areas, Cliff Palace continues to evoke a mystical and mystifying aura for the 650,000 annual visitors to Mesa Verde National Park.

The park, until recently, was also home to the oldest and largest piñon-juniper forest in the nation, with some of the trees dating back 500 years. That was before lightning strikes in 1996 and 2000 started several catastrophic fires that torched 30,000 acres and threatened

the existence of Cliff Palace and dozens of other dwelling sites.

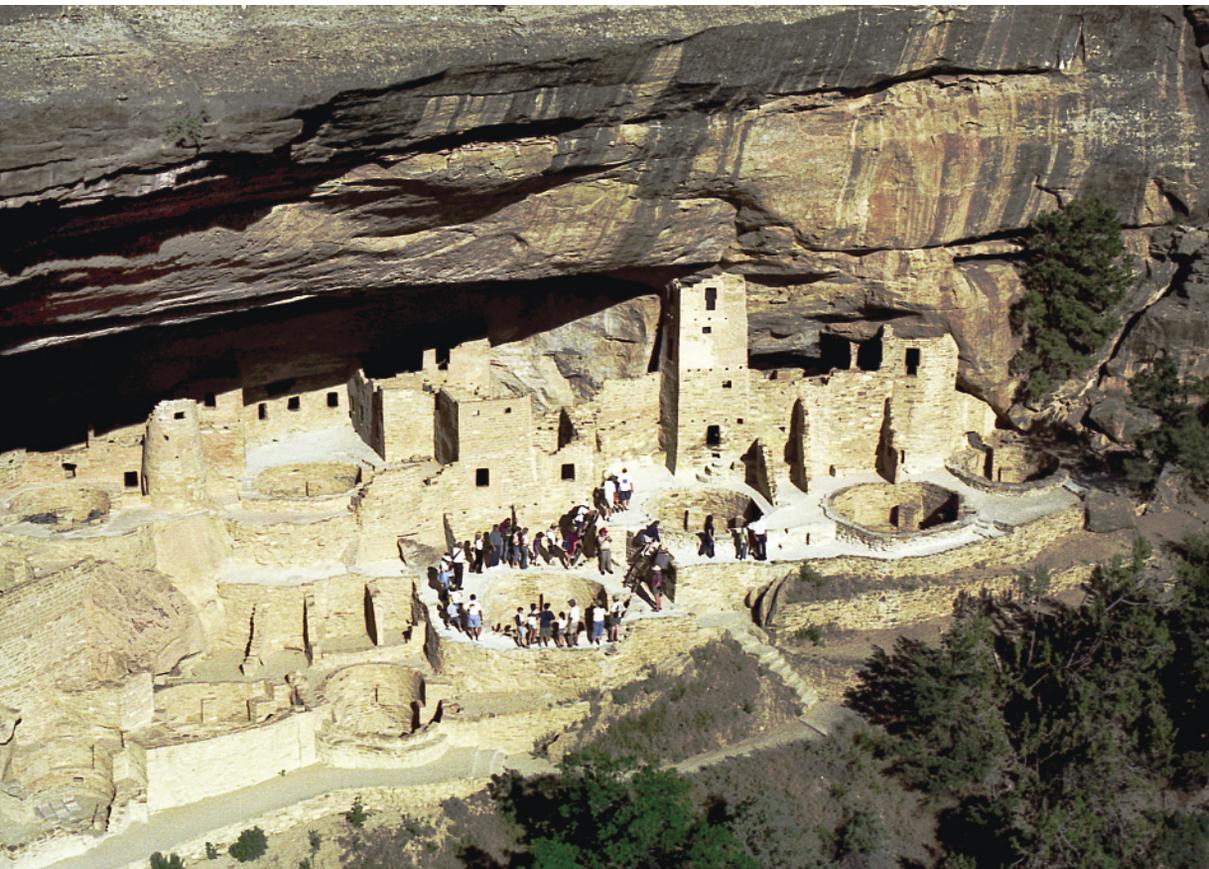
When a lightning bolt struck again in late July 2002, in the midst of the worst drought in 100 years, the park's historic headquarters, museum and staff accommodations faced the same fate as the incinerated piñon-junipers.

But rather than wait for the expected showdown, Mesa Verde had begun a fuel reduction project 10 years earlier that would pay big dividends.

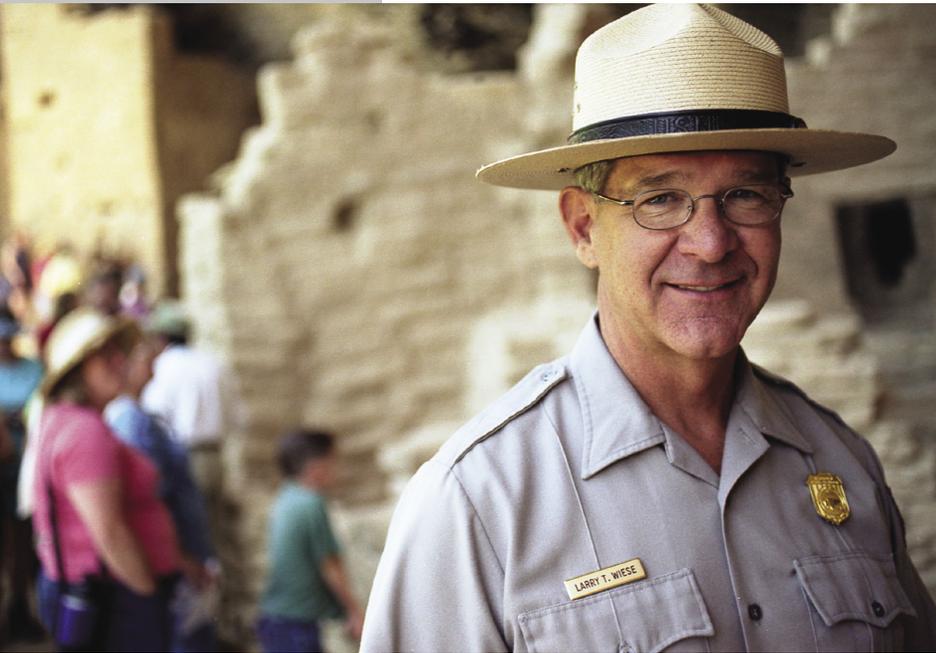
Catastrophic fire long overdue

"This was the fire we've feared for more than 30 years," said Tim Oliverius, who was Mesa Verde National Park's fire rehabilitation manager from 1990 to 2001.

With only one route leading in and out of the park, the wooded area alongside the road could have turned deadly if the park hadn't been evacuated in time. As it was, the scruffy



Cliff Palace ruins



Larry Wiese,
superintendent of Mesa
Verde National Park

piñon-juniper forest became a skeletal graveyard of charred trees.

According to Oliverius, it was inevitable that 100 years of fire suppression would create a catastrophic firestorm. The park puts out dozens of fires a year, many of them started by lightning strikes. Since the 1930s, more than 800 fires have started, with most confined to less than an acre. The scorched piñon-juniper trees were now a “decadent forest,” meaning it housed a lot of downed wood — 15 to 18 tons of dead fuels per acre.

“With that kind of suppression and dead fuel, the forest was long overdue to burn. It probably reached its peak 50 years ago,” Oliverius said.

When Oliverius joined the park staff, he spearheaded an aggressive response to the looming threat. He started building a buffer of defensible space in 1992 with a fuel reduction plan that would manually thin out 159 acres around the park’s 70 structures and a dozen cliff dwellings, including Cliff Palace.

The goal of the long-term fuel reduction project was to create a 20-foot space between each mature fuel tree crown area. By doing this

in advance of a fire, the strategy was designed to lower fire intensity and allow flames to drop to the ground where they are much easier to control. All of the recorded large fires in the park’s history have been high-intensity crown fires.

By creating a 12-acre safety zone near the headquarters area, park managers would ensure firefighter, employee and visitor safety in the event of a road closure or fire evacuation. The safety zone would also provide firefighters with an area they could retreat to during dangerous activity.

While at the time piñon-junipers made up only half the trees in the park, they were associated with 94 percent of the fires. “Piñon-junipers burn with such intense heat that firefighters can’t make frontal attacks on them in a windstorm,” Oliverius said.

Out of 52,000 acres, Oliverius’s plan called for thinning only 159 acres around staff housing, the most famous cliff dwellings and the park’s administrative buildings. Yet his proposal sparked statewide concern, with the most vocal opposition coming from coworkers who wanted to save the piñon-junipers.

“I wouldn’t say they hated me, but I definitely wasn’t well liked,” Oliverius admitted, adding that he had initially thought the strongest resistance to the program would come from outside the park.

Even though Oliverius had support from the park superintendent, staff that lived in the housing area with Oliverius enjoyed the lavish though highly flammable piñon-junipers, particularly the privacy and shading they provided for the picturesque cottages. The park’s defensible space plan recommended the mechanical removal of 170 trees within the housing area.

“When you talk about cutting down a tree, that’s when the emotions come out,” said Larry Wiese, superintendent of Mesa Verde National Park. “As a national park our mandate is clear. We’re about protecting and preserving the nation’s resources. When you

“When you talk about taking out resources, that’s where the emotional side of people takes over, and you lose the intellectual side of what we’re trying to do.”

– Larry Wiese

talk about taking out resources, that’s where the emotional side of people takes over, and you lose the intellectual side of what we’re trying to do.”

Some of the park staff were so upset that a petition was circulated to stop the removal of the trees. Oliverius understood his coworkers’ perspective.

“You don’t see piñon-junipers like we have here. This is world-class. There was a loud outcry,” he said. In order to reconcile differing opinions on how much to reduce the vegetation, numerous meetings were held and compromises reached. One of those compromises involved sparing trees that maintained “aesthetics and unique characteristics”—like rare or record trees.

The only environmental group to support the reduction project was the National Parks and Conservation Association.

According to Oliverius, “The group did not physically sign off on the plan, but its regional representative came to the park and verbally endorsed the fuel reduction plan after

reviewing the fuel reduction work on site and evaluating the purpose and necessity of the project.”

Some other environmental organizations, however, opposed the plan, and once the news media caught wind of the fuel reduction program they tended to side with environmentalists on the controversial debate. In 1995, *The Denver Post* challenged the legality of the program, criticizing Oliverius’ plan as “poorly thought-out” and writing that the project “looks like hell.”

Indeed, after the fuel reduction was completed around the housing area, the once lush grove that surrounded the row of charming cottages resembled a minimalist landscape.

Oliverius stressed that the crowning space between treetops was only 20 feet, as opposed to the 40 feet that many mitigation specialists were advising was necessary to ensure 100 percent fire protection. More trees could have been taken out, but the park responded to public and staff input.



This cottage in Mesa Verde National Park survived the Long Mesa Fire which burned the hillside behind it

“It’s important that we continue the fuel reduction program or face another catastrophic fire.”

— Larry Wiese

It took the catastrophic fires in 1996 and 2000 to begin convincing park staff and environmental organizations that the fuel reduction plan was a sound idea. Those fires burned more than half of Mesa Verde’s acreage, though they stayed clear of the park’s major structures and cliff dwellings.

The park continued with the tedious and labor-intensive mechanical reduction of trees. Crews had to do most of the thinning with chainsaws as opposed to prescribed burnings in order to preserve prehistoric sites that may be buried under the forests.

“Toward the end of our project in 2001, it was costing \$4,000 an acre,” said Oliverius. “It all had to be done by hand. We didn’t use any machinery except chainsaws. Everything had to be carried out of the woods, put in a truck, hauled in one area and burned in the winter time.”

The replacement of the cottages’ wood-shake roofs was another battle for the ranger, since the park cottages where the staff lived were on the National Register of Historic Places.

“Historical architects at first refused to agree with the asphalt roofs, saying that an asphalt roof would breach the integrity of the structure,” Oliverius recalled. “We were able to obtain asphalt imitation wood-shake style shingles and got those roofs put on in the nick of time.”

Fuel reduction makes difference

In July 2002, the plan paid off.

“Because of where it was situated, the fire came blowing right through the park, the worst place we could have had a fire,” said Scott McDermid, who served as a task force

leader fighting the Long Mesa Fire. “In the remote part of the park flame lengths were 100 feet high. As soon as the fire hit the staff housing area, the flames dropped to 15 feet, and they continued to drop.

“The reduction area made all the difference. Had that not been there, we would have lost every building. There would have been no safety zone, no place to make a stand and all the fire crews would have had to leave.”

Oliverius said that more than 60 structures, including staff housing and the museum, were spared. “What stopped the blaze was that it went from 40 tons per acre of fuel to 15 tons per acre,” he explained.

The initial cost for the 159-acre project was estimated at \$250,000 but eventually grew to \$400,000, which was still a bargain to Oliverius.

“If we hadn’t done the fuel reduction project we would have lost all the structures, which are worth more than \$12 million, and almost all of them are on the National Register of Historic Places,” he said. The cost of losing the cliff dwellings would have been incalculable.

The Long Mesa Fire had in fact nicked at the top of the Spruce Tree House cliff dwelling located near the park’s headquarters and scorched the canyon below it. Red slurry dusted the sandstone surrounding one of the park’s most visited cliff sites.

“The fire would have done damage to the dwellings if it had gotten to them,” said Superintendent Wiese. “There is wood built into the dwellings and there is also the problem of erosion.”

Wiese knew the park’s reduction program was a success, just based on the fact

Progress of the Long Mesa Fire



the buildings were still standing after the fire was contained. But he wasn't prepared for the overwhelming visual confirmation from a helicopter as he assessed the damage.

"Every place we thinned, there was green and everywhere we hadn't thinned it was black," he said. "So when you look at the burned area from the air, you saw islands of green in a black ocean."

Wiese said his staff is now working on a fire management plan for the entire mesa.

"Only 40 to 50 percent of the park has burned," he explained. "There are plenty of acres left, including 100,000 acres of land adjacent to the park on the mesa that belongs to the Ute Mountain Ute Tribe. We're going to solicit public input and ideas from people on the boundaries of the park. It's important that we continue the fuel reduction program or face another catastrophic fire."

As for Oliverius, he became acting fire management officer at Indiana Dunes National Lakeshore. When asked why he stayed with his fuel reduction plan in the face of such considerable opposition, he was typically no-nonsense.

"It was staring me right in the face," he said. "There are a lot of gray areas, but this was a black and white issue. It wasn't going to go away."

He also took away from the experience a number of important lessons, including the values of patience and persistence.

"The project at times was frustrating and didn't go as fast as expected," Oliverius said. "We had success in small increments. Sometimes we only cleared six or eight acres a year, and never more than 20 acres in a year. I just learned to measure our success



in small increments and to not let it get me down.

"You're never going to change everyone's opinion. But you have to proceed in what you believe is right."

One tourist, visiting the park after it reopened in August 2002, described the wildfire's devastation as "sad." Oliverius had a different point of view.

"I don't think of the fire as 'sad,'" he said. "It's actually kind of exciting. Coming back in future years, we can watch the forest recover. It's nature's way of rejuvenating the land." ■

Park buildings surrounded by burned piñon-juniper forest



Fighting the Fuels

State Efforts Target Fire Risk in the Black Hills

JEFF GIES IS IN A RACE AGAINST FIRE. And the clock is ticking.

Gies is a wildland/urban interface specialist with the South Dakota Wildland Fire Suppression Division, a state agency charged with wildland fire suppression, training, education and prevention.

It's his job to help minimize the impact and spread of fire in the state's wildland areas—ideally before they're stricken by fire.

Little by little, Gies is doing just that. His newest tool is a special fuels reduction program the state launched in 2002 to better protect at-risk homes and properties in the scenic, forested Black Hills.

The idea of the program is to reduce the fire danger on targeted properties by clearing the forest floor of downed branches and trees, and by removing some standing trees.

In doing so, the fire intensity and rate of spread in forested areas can be cut dramatically, Gies said. The overall health of the forest can be improved. Lives and property can be saved.

Dealing with danger

The job of protecting the state's Black Hills is not his alone. At least 80 percent of the

area—which spans more than 1.5 million acres of land in western South Dakota—makes up the Black Hills National Forest.

U.S. Forest Service officials there have been on the offensive for some time to minimize or eliminate high-risk fire areas through a variety of projects.

But there are places outside of the forest boundaries that badly needed attention as well. And people are living in them.

That's what makes Gies uneasy. He is responsible for those areas, many of which are at an increased risk because forest conditions are ripe to feed a fire.

"In the last few years, we were starting to see the indicators of an increased wildfire problem," Gies said. "We were having above-average temperatures and below-average moisture. In many places, the tree health is poor and the fuel buildup is high."

And there have been fires. From 2000 to 2002 alone, wildfires in the Black Hills burned more than 130,000 acres of both private woodlands and federal forest.

State wildland fire officials knew they had a problem. They just didn't have a way to fix it.

Forming a battle plan

In early 2002, that began to change.

South Dakota Wildland Fire Suppression Division Coordinator Joe Lowe learned that grants were available through the National Fire Plan to do fuels reduction in wildland areas at no cost to landowners. That money, Lowe figured, could augment a similar state effort begun in 2001 to reduce the fuel load on private property.

The National Fire Plan is funded by the U.S. Forest Service to manage the impact of wildfires on communities and the environment.

So Lowe and Gies met with federal forest service officials to form a plan.

"We looked at areas that are at high risk for wildfire in coordination with the forest service," said Gies. "One of the parameters of this program is that the areas we treat have

Jeff Gies, South
Dakota Wildland Fire
Suppression Division



to be adjacent to a planned or ongoing U.S. Forest Service fuels treatment project. That qualifier helped us narrow down the projects we would try to do.”

Lowe and Gies developed three project areas throughout the Black Hills—all on private property and all at high risk because the trees had suffered severe storm damage and/or bug kill, primarily from mountain pine beetles.

The state submitted grant requests for each project and by May 2002 all three requests, totaling \$420,000, were approved.

Finding the help

With the funding in place, state wildland fire officials began to look at various labor options to actually get the work done. Tree thinning and debris clearing are labor intensive, Gies said, and the agency didn’t have the manpower or the time to do it themselves.

But Lowe had an idea. Some months earlier, a man who wanted to reorganize the Black Hats—an American Indian wildland firefighting team that was prominent from the mid-1960s to the late-1980s—had visited him. The team disbanded in 1988.

Lowe had long thought there was a need for another “hand crew” in the Black Hills but didn’t have the money to make it happen. Hand crews fight fire literally by hand, using a variety of tools to both extinguish flames and to create breaks in the landscape that will stop the spread of fire.

At this point, only one permanent hand crew was available for the entire Black Hills—a U.S. Forest Service Hot Shot crew based near Custer in the southern Hills. Although additional crews can be quickly assembled from federal and state agencies if needed, Lowe wanted another permanent, full-time team.

So he decided to create a new Black Hats crew—one that would work primarily to remove dead and downed trees in the target areas, but also would be available to fight the early stages of wildfires.

Within 45 days, a 20-person crew had been hired and trained.

Gies launched them immediately. Fire season was already under way and three-year drought conditions were raising the fire danger.

Attacking the problem

He focused the crew on the biggest project first—a recreational area known as Gordon Gulch, just east of Hill City and in the heart of the Black Hills National Forest.

The 140-acre area—privately owned by one family—is dotted with 40 vacation cabins available for lease. The national forest borders three sides of it. And it was littered with downed trees after severe ice and snowstorms pounded the area in April 2000.

“We were worried about this area because of the risk to all these properties,” Gies said. “Also, it was a good project for the crew to get some experience on before they got into smaller, individual properties.”

From June to mid-October 2002, the crew moved and piled tons of downed tree debris and thinned out some standing trees to improve the area’s chances of surviving a wildfire. And in between all that, they fought wildfires.

The result is just what Gies was looking for.

“This property now will have a very good chance of withstanding a severe wildfire,” Gies said. “Before this project, it would not have. There was so much fuel there and a fire would have burned with such intensity, that it would have destroyed the trees and potentially many of the cabins. The heat load in there would have been tremendous.”

Cabin tenants reportedly were happy with the work as well.

“We were pleasantly surprised by the reaction of all the people who have cabins up there,” Gies added. “A lot of them went on and on about how happy they were that we were cleaning up the area. It’s been a huge

“The areas that we have treated are going to have a good chance of surviving now. It will pay off in a big way...”

— Jeff Gies



Trees infected by mountain pine beetles

concern for them. Some of them even went out and put ribbons on trees [to be removed] close to their cabins because they were afraid of the fire threat.”

Catastrophe awaits

Gordon Gulch wasn't the only area where a fire could be catastrophic, Gies said. There's another big risk, high in the northern Black Hills, just west of the town of Sturgis. It's known as Beaver Park.

In this area, mountain pine beetles had attacked an estimated 6,000 to 7,000 acres of pine trees, leaving the majority of them brown, dry and dead. The infestation was still spreading.

“If a wildfire ever got into Beaver Park and we still had acres and acres of dead trees, we could get a real firestorm in there,” Gies said.

Until the Black Hills Fire Prevention Agreement was signed into federal law in August 2002, legal challenges had prevented the U.S. Forest Service from thinning dead trees in Beaver Park. The agreement represents the combined efforts of key environmentalists, land-use groups and government officials, and paved the way for work to begin in late 2002.

Gies' problem was that approximately 150 homes were scattered throughout the woods adjacent to the area that includes the dead tree stand. That puts people and property at high risk in the event of a fire.

So he conducted a risk assessment on every property in the area looking for the worst-case scenarios. At the same time, he created a detailed map showing the locations of the homes for firefighters to use if the area were to start burning.

Lowe and Gies targeted 10 properties for the fuels reduction program. Gies contacted homeowners to determine their willingness to participate. All agreed to the voluntary program. More properties will be treated if money is available.

Making a difference

Dan Nelson's 16-acre property high in the Hills was one of those targeted for treatment.

Nelson had an abundance of downed tree limbs from past storms and dense woods of thin trees that were growing too close together.

The fire load was huge and Nelson knew it. He'd seen wildfires in the Hills over the years, including two major ones in the summer of 2002, each within about five miles of his property. Combined, the fires burned about 15,000 acres. One nearly burned the town of Deadwood.

“They asked if I was interested in having this thinned and I couldn't believe it,” Nelson said. “I didn't even have to think about whether to say ‘yes.’”

Twice before, Nelson had done his own work to clean up the woods around his house, once thinning approximately 4 acres of land by himself. It took one person a full day to cut and pile 10 to 12 trees, he says.

“As soon as we bought the property, we removed what we thought was needed,” Nelson said. “Then after the fires last summer, I started clearing more. But it's physically impossible for one person to do it.”

Within one week, a 10-person crew had removed the downed timber and several small trees to create better spacing so that a fire wouldn't be able to burn as hot or spread as fast. The debris was gathered into more than 150 piles that will later be hauled away or burned, conditions permitting.

Nelson is thrilled with the results.

“I am so impressed with the way it looks,” Nelson said. “This crew is very good. I'm not as worried about fire now as before, not only because of this but because of what the forest service has done also.”

Gies' third project began in early 2003 just south of the city of Spearfish.

Known as the Griggs Project, the treatment area encompasses a subdivision of more than 200 homes, bordered on two sides by the national forest. Steep slopes, dense overgrowth and downed timber put the subdivision at risk, Gies says.

Federal forest service efforts to reduce the fire load already are under way. The state's project will complement those efforts, Gies added.

"Our goal is to create a fuel break by treating as much of the perimeter of this subdivision as we can," he said.

That work augments other local efforts underway as well, including fire risk assessment, creating residential defensible space and organizing into a "Firewise" community. Firewise is a national program that encourages individuals and communities in the wildland/urban interface to embrace fire-safe practices.

Protecting the future

When completed, Gies said, the state's fuels reduction projects are going to make a difference the next time fire strikes. Already, the program has exceeded his initial expectations.

"I am not only amazed, but I am really pleased at how all this came together in a short period of time and what we've been able to accomplish with these high-hazard areas," Gies said. "The areas that we have treated are going to have a good chance of surviving now. It will pay off in a big way, not only for their homes and structures but for their timber too."

To Gies, the use of government funds to help individual homeowners represents a public-private partnership with far-reaching benefits.

"This is a severe problem," he says. "It's landowners with storm damage and bug damage. There is no way they could handle this by themselves on their properties unless they hired it out and most don't have the resources for that.

"I think we [government] have a responsibility to a degree to identify the threat, as we have, and come up with plans for emergencies, both in treatment and mitigation," Gies adds. "If we have the ability to reduce the threat to them and to our emergency



personnel who ultimately have to deal with it, I feel we are doing the right thing."

It's been estimated that it could take as long as 100 years to do the fuel-reduction work needed in the expansive Black Hills. Still, that doesn't discourage Gies.

"This fuel situation in the Black Hills and the rest of the country is a project that will take a long time to get even close to catching up with," Gies said. "It's like mowing the grass on your lawn. The timber is going to continue to come back. The undergrowth will come back. The issues with storm damage don't ever go away.

"If, through these projects, we can get some of the worst problem areas cleaned up and at the same time, get the public educated about the problem, it will show the successes of these types of projects. Hopefully, it will help." ■

Black Hills resident
Dan Nelson

The Nelson property



South Dakota Black Hats

Good Guys Defend the Forest



IN THE MOVIES, the good guys always wear white. Not so in South Dakota. There, they wear black—hats, that is.

Those “good guys” are the South Dakota Black Hats, a crew of specially trained men and women who defend the state’s forests from the effects of wildfire.

Their defense is twofold. They clean up the forests to minimize the impact of wildfire. And, when a fire breaks out, they attack it—hard and fast—in an effort to quickly control the blaze.

The crew is named after a highly-skilled American Indian wildland firefighting team called the Black Hats, which originated in the mid-1960s on South Dakota’s Pine Ridge Indian Reservation.

The original Black Hats — a name they gave themselves — traveled the country fighting wildfires. They were considered to be among the best in the business before disbanding in 1988.

Black Hats reborn

The new Black Hats were organized in June 2002 by the South Dakota Wildland Fire Suppression Division to fill a critical void in the state’s wildfire prevention and response activities.

Specifically, the state needed work crews to carry out three large fuel-reduction

projects it was managing on private land in the forested Black Hills. In addition, another permanent hand crew was needed to provide the initial attack on new wildfires.

Neither is a job for the faint of heart. During fuels reduction work, crew members begin their day at 6:30 a.m. with a 30-minute briefing to review the day’s goals before heading to the project site.

For the next eight hours, save for a 30-minute lunch break, crew members carry out the day’s objectives, which can range from cutting and piling downed timber and brush to removing standing trees that are dead or deemed to have low survivability.

The tree debris is then gathered into several teepee-shaped piles that can later be burned or hauled away.

When the daily site work is done, the crew then heads to a fitness center for two hours of physical conditioning, which includes running two miles, weight lifting and strength training.

During wildfire season, approximately April 1 to October 31, crew members are on-call 24 hours a day and must maintain a 45-minute response capability to their headquarters in Rapid City.

The rules are tough. The demands are high. And the work is grueling. But that’s because people’s lives and homes are at stake when wildfires are raging. The crew has to be ready.

Looking at a leader

Dulcie Running Hawk, 34, is a squad boss with the Black Hats. That makes her responsible for the day-to-day work and safety of four other crew members—whether they’re clearing downed debris or fighting fire.

“When we’re on a fire, it’s my responsibility as a squad boss to make sure these four people make it home every night,” said Running Hawk.

Safety is paramount on the fuels projects as well, Running Hawk said. That means

Black Hats Squad Boss
Dulcie Running Hawk



watching for hazardous site conditions, and ensuring that safety procedures are being followed, and workers are properly rested and hydrated.

Running Hawk has been with the Black Hats since its inception. In a sense, it's a destiny for her because fire has long been a part of her life.

When she was young, her father worked as a seasonal wildland firefighter and later headed a 20-person firefighting crew from the Cheyenne River Sioux Indian Reservation in west-central South Dakota.

At 17, she joined his crew. For the next three years, Running Hawk learned the trade and honed her skills as a wildland firefighter. It was hard, physical work. It was even harder working for her father. She wanted to quit more times than she can remember.

"It was quite interesting working with my father," she said. "He had to be harder on me because I was his daughter. There were so many days when I would come back and complain to my mom about how hard firefighting was. When I talked about quitting, she said, 'It's up to you.'"

Running Hawk stuck with it until she met and married her husband at age 20. They immediately moved to Germany where he was stationed in the U.S. Army for nearly four years.

In 1991, the couple returned to the United States and settled in Rapid City. By then, she was the mother of four children.

In January 2002, fire intervened in her life again. Running Hawk had been working at the Federal Beef Plant in Rapid City when it was heavily damaged by fire. Shortly thereafter, the business closed.

Running Hawk began searching for work and a means to support her family. That's when she heard about the state's efforts to assemble a fuels mitigation/wildland firefighting crew. She knew it was something she could do.

In short order, she and 19 others were hired and trained. Most were inexperienced at



firefighting. A few had professional tree-cutting experience. All brought diversity to the team which, unlike the original Black Hats, is not entirely American Indian.

Fire in the Hills

The crew had barely gotten its feet wet when a large wildfire broke out in the Black Hills near the town of Deadwood.

Running Hawk was there. Suddenly, everything she'd learned 17 years before came flooding back. It was exciting, nerve-wracking and exhausting all at the same time, she said.

"Being out on a fire is very scary," Running Hawk said. "You don't know what the fire is going to do. The fire can change. A lot can happen. You have to know where your safety zones are, what the weather is doing, what kind of terrain you are working with.

"But I like the excitement of being a firefighter. You know you are out there saving lives and property. Afterward, when the fire is put out, you know you did a good job and your crew did a good job. I like that feeling."

Work on the fuels-reduction project is just as rewarding, she said, because the homeowners have been both appreciative of their efforts and happy with the results.

"When you are on fuels, you are also doing it to protect the houses in case of a fire breaking out in that area," said Running Hawk. "When we're done with our job, we know that a house has a better chance of being safe from a wildfire." ■

South Dakota's
Black Hats

Goats Take Bite Out of Fire Risk

'Fuel-reduction specialists' demonstrate effectiveness

KATHY VOTH WAS ON DUTY as a public affairs officer for the Bureau of Land Management (BLM) when the tragedy at Colorado's Storm King Mountain occurred in 1994. As the terrible human toll of that July day mounted, Voth began to think about ways to lessen the risks faced by firefighters, a process that continued even as she was helping to plan the memorials for the 14 firefighters who died.

"Part of my job was to help create a memorial trail and to work with the families on the biographies of the firefighters," she said. "It was a painful time, and I started to think that there really had to be a better way for us to manage fire than to put our firefighters in danger."

One of the purposes of the Storm King Mountain Memorial Trail is to help people understand what happened there, and to allow for reflection on how future tragedies can be prevented. Voth carried that challenge with her to Utah, where she relocated with BLM in 1997.

Something clicked one day as she talked with a colleague about goats. Voth had a pet goat at home, and she knew from experience that goats would eat almost anything. Why not, then, teach them to eat the often-unappetizing fire fuels that make life so dangerous for those who fight fire?

Today, Belly Girl, Complainer, Thumb-biter and some 75 other goats constitute a cadre of Utah-based fuel reduction specialists eating their way to happiness. At the same time, the goats are demonstrating their effectiveness in lessening hazardous ladder fuels like oakbrush that can carry a fire.

The Utah goats are part of a study being conducted by Utah State University, Utah National Guard and BLM. The effort is being funded by the Joint Fire Science Program, which is a consortium of federal agencies that share firefighting responsibilities. The goal of the study is to provide communities, agencies and goat producers with comprehensive information about using goats to reduce fire fuels.

Voth started out with the idea that the goats would primarily be employed by federal agencies like BLM, but as she worked through the process it turned out that communities were interested too. After a demonstration project at Utah's Camp Williams, in the summer of 2002 Voth moved 15 members of the herd to Woodland Hills, a Utah community that faces extreme fire dangers.

"The cost of doing the work mechanically is horrendous, and you still have to process all the fuel," said Assistant Fire Chief Jeff Anderson, who campaigned for the goats to be brought to Woodland Hills. "I think the goats do a better job. They trample the duff with their feet and break it down, and they're willing to eat the aftergrowth."

Sean Hammond, a recent Utah State graduate who works with Voth, explained the process. "Vegetation is a living thing, and it needs to be trained. Goats will eat the growth points, and if you consistently graze that down over a three-to-five year period it will stop resprouting because the reserves in the root system will be depleted."

At Camp Williams, goats had been used since 1996, but it took a wildfire in July 2001 to fully demonstrate their effectiveness. Lt. Colonel Bob Dunton, an environmental officer with the Utah National Guard, is responsible for fire management at the military facility. Although from the beginning he saw goats as a biological control that made sense, not everyone shared his view.

"There was some skepticism from Camp Williams staff when the project was first introduced," he said. "Not everyone took it seriously, and they didn't see what role the goats could play in wildfire management."

That changed after a large wildfire started on-post as a result of a training exercise. Dunton, with 10 years' experience in wildland firefighting, five as a smoke-jumper, saw flame lengths drop from 15 feet to two feet as they approached the goat treatment sites. Nearby, in an area where a hand crew had worked, the results were not nearly as dramatic.



Kathy Voth, Hank Williams (in back), and Agnes

Dunton said that there is now broad-based support for the use of goats at Camp Williams, but he added that such an undertaking does require effort.

“It is not an easy project,” Dunton said. “You have to move the animals, keep them fenced, care for them and otherwise meet their life needs,” which include providing water and, as a dietary supplement, salt.

There also might be issues for land managers who find that an area treated by goats loses aesthetic value. But for Dunton, who is currently working to secure funding to bring goats back to Camp Williams, the benefits outweigh the potential problems.

“Fire suppression costs are high, and if a fire migrates off our boundaries the issue is even bigger than suppression,” he said. “If a fire were to move off-post into neighboring areas the possible legal ramifications would be extreme.”

According to Voth, goats are most effective in shrub-dominated environments.

“We’ve experimented with pine trees, and the goats will knock the bark off and eat the lower branches. But that leaves a lot of standing dead timber, which is good fuel. So where the goats work best is reducing the amount of vegetation in the understory, particularly in areas where people are living in the wildland/urban interface.”

As a targeted fuel treatment, goats can provide an attractive alternative to prescribed burns, for which the proper temperature, wind and humidity are necessary. And unlike hand crews, goats do not produce slash piles that have to be burned later. There is also a cost factor—based on Voth’s “goat calculator,” it would cost \$31,000 for 200 goats to clear one square mile, compared to \$132,000 for a hand crew.

One of the roadblocks that Anderson initially encountered in Woodland Hills was local ordinances that prohibited the use of male goats and the construction of electric fencing, which is necessary to keep the goats in and predators out. Both he and Voth appeared at a city council meeting and ultimately persuaded council members to relax the fence ordinance; it was also agreed that male goats would not be used.

Voth admitted that some amount of education is always in order. “People have traditionally heard all these things about goats, like they are hard to manage, they can get out of any fence, they eat anything. So it is really going to take some ongoing demonstrations to help people become comfortable with how it works.

“It’s like driving a car. The first time is kind of scary, but after a while it’s no big deal.”

Another issue is what to do with the goats during the winter. Unlike California, where fuel-eating goats can work year-round, Rocky Mountain states can only use the goats until the weather turns in early fall. Since a certain amount of training is necessary to teach the goats that something like oakbrush can be food, continuity is beneficial.

“You could sell the goats for meat each year, but then you have to get new animals,” Voth said. “You don’t want to get rid of them at the end of the season because they’ve just learned how to be useful, and they’re also able to teach the next generation.”

Voth, who was recently assigned to a BLM office in Fort Collins, Colorado, to coordinate the goat program full-time, is working to complete a handbook that will guide those interested in using goats as part of a comprehensive fire fuel reduction strategy, addressing critical issues such as where to put the goats and how to manage and care for the animals. (One hint: Do not have a breeding pair of goats out on the range.)

If nothing else, Voth hopes the handbook will help communities, agencies and goat producers know what questions to ask. She is also looking for new demonstration sites. (For those interested, Voth can be contacted at (970) 295-5718; her e-mail address is kvoth@cc.usu.edu.)

As for Anderson, he intends to bring in goats of his own now that Voth’s herd has left.

“They never complain, they’re friendly, and they’re up by six working,” he said. “It’s a solution that benefits everybody.” ■



Kathy Voth holding Emmy Lou, with Rufus (brown), Hank Williams (white), Agnes (far left),



A Wine and (Goat) Cheese Affair

More about goats
and fire mitigation

IN ONE COMMUNITY goats have already become a much beloved part of the landscape.

Laguna Beach is a small town of 24,000 residents in Southern California with sandy beaches, picturesque canyons and coastal hills. In October 1993, a devastating fire-storm swept across 14,000 brush-covered acres and engulfed much of the town, damaging or destroying 441 homes.

For the last seven years, a small army of goats has been on regular patrol in Laguna Beach, eating the dense vegetation that can fuel a fire.

“The community understands based on the 1993 fire why it is necessary to reduce the fuel levels,” said Mike Phillips, an environmental specialist with the city who helps coordinate the goat program. “The goats are a cost-effective means of doing that. And there is an added benefit—people really like them.”

Phillips said it is not uncommon to see buses and cars come by to visit the goats when they are working downtown behind City Hall. There are also wine-and-cheese parties at local homes when the goats are stationed nearby.

Laguna Beach first started using goats in the early 1990s. City Manager Ken Frank brought the idea with him from Northern California when he moved south. After the fire, Laguna Beach received a hazard mitigation grant from the state of California and FEMA to expand the program.

Frank, who lost his home in the 1993 fire, said the value of the goats was clear even in the midst of that destructive blaze.

“The fire was moving toward our North Laguna neighborhoods, and before the flames reached the houses you could see them diminish when they hit the fuel breaks. Where we had the fuel breaks in North Laguna we didn’t lose a single house.”

But according to Frank, goats are not a panacea.

“Even where we saved the houses in North Laguna, firefighters were putting water on roofs. And heavy winds did push the fire across a 150-foot fuel break that the goats had created,” he said. “Goats are more effective and efficient than most other fuel reduction programs, but they are not a substitute for firefighters.”

In Laguna Beach, goats are one piece of the community’s overall wildfire mitigation strategy and their use is strongly supported by the local fire department, which implemented the goat program and continues to oversee it.

Today an average of 500 goats work year-round and cover approximately 1,445 acres annually. Fuel reduction is split between public lands around the town perimeter and strategically located private lots. The goats work a circuit and re-treat areas on a regular basis, costing the city general fund \$198,000 per year. Paying for the goats has not been an issue—Phillips said it is one of the most popular municipal programs.

The city’s agreement with the goat contractor establishes a specified amount of land to be treated; it is up to the contractor to determine how many goats will be necessary to achieve the goal. For example, heavy rains might mean more goats are needed to keep up with the increased vegetation.

The contractor also handles all of the logistical arrangements associated with the goats, such as erecting the 200-foot by 300-foot pens in which they work. An on-site herder is responsible for their day-to-day care.

To determine the cost-effectiveness of the goat program, Laguna Beach conducted a field test. A 10-person hand crew and 550 goats were each put on a one-acre lot. The hand crew took 7.5 hours to clear the acre while the goats took less than seven hours. The crew cost the city \$1,125 (based on \$15 per hour per person), compared to the

\$542.46 per-day cost of the goats—a savings of \$582.54.

“And the test was somewhat skewed because we used relatively flat terrain,” Phillips said. “It would have been much more difficult for the hand crew had we put them on steeper hillsides.” The city still uses hand crews on individual lots in the interior of the town.

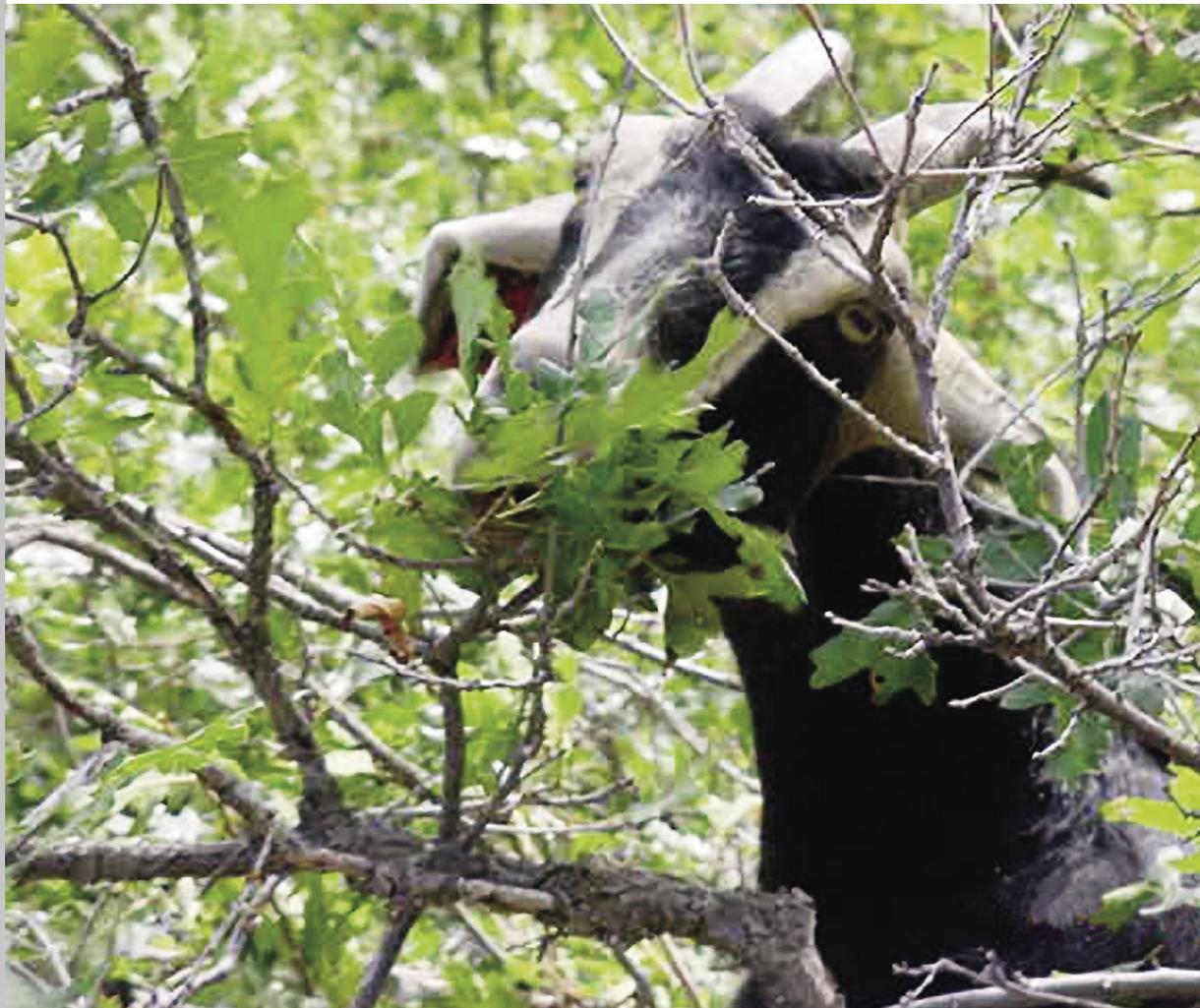
Frank and Phillips had a few suggestions for other communities that might consider a goat program:

- ✓ Address environmental impacts. Before introducing goats hire an environmental consultant to walk the area and identify

sensitive plant species to be protected. Also be aware of existing environmental regulations.

- ✓ Be sensitive to community concerns. Talk to residents before putting 500 goats on a hillside — in Laguna Beach there were questions about the goats’ effect on water quality.
- ✓ Consider the long-term commitment. Goats may not be as cost-effective if they are on shorter, temporary assignments or if they work on smaller areas.

So far, there has not been a major wildfire in Laguna Beach since 1993, but even after small fires the city gets calls from residents asking when the goats can come. ■



The Little Train that Could

Despite Wildfire Threat, Railroad Stays on Track

CONDUCTOR DAVE MARTINEZ of the Durango & Silverton Narrow Gauge Railroad stands on the open platform of a century-old passenger car and looks down the length of the train.

It's boarding time. Families, checking their tickets, are flocking to bright, golden-yellow coach cars. Once on board, passengers scurry to find their seats, pulling on jackets in anticipation of the high-altitude chill. Hard-core rail fans, camcorders in hand, dash to the locomotive for last-minute close-ups of steam and smoke.

As the final authority on the train, Martinez must see that passengers are safely aboard, supplies are properly stored and the departure time is observed before the train can move onto the line.

Engineer Monty Caudle looks down the right side of the train from his seat in a vintage steam locomotive and waits for the conductor's signal.

Martinez shouts, "All aboard" and waves. Caudle nudges the throttle forward. The train's whistle blows... long—long—short—long. The signal is always the same as the engine approaches its first public crossing. But each engineer has a distinctive hand on the whistle cord, and everyone in the yard knows who's driving No. 482 today.

There is both a mystique and a dogged determination to the Durango & Silverton Narrow Gauge Railroad. It's the vintage steam locomotives, the adventure of riding through southwestern Colorado's breathtaking vistas and the taste of the West's gold-rush era that beckon visitors from around the world.

But in the summer of 2002, Colorado's wildfires brought the railroad to the precipice of disaster by threatening its very existence.

Warning signs

Since 1882, when the railroad—then known as the Denver & Rio Grande—began hauling gold and silver from ore mines, coal-fired steam locomotives have powered the train. It runs on rails that are just three feet wide, hence the name "narrow gauge," which enables the train to navigate steep hills and tight, mountain turns.

But those coal-fired engines blow out burning cinders that can, and often do, start spot fires.

Steep grades along the route from the railroad's base in Durango to its northern terminus in the town of Silverton, about 45 miles away, enhance the chance that a fire will start because the locomotives are literally "pouring on the coals" to make the climbs.

"Being a coal-fired steam engine, we create ash and sparks," says Allen C. Harper, president of the Durango & Silverton (D&SNGRR). "As a result, we've always had spark arrestors on the stacks of the train to catch sparks that come up through the chimney. We have always taken precautions to make sure that following every train, there was a cart with a two-man crew that would look for any sparks that came out, or look for fires and call for assistance."

Routinely, the railroad takes advantage of winter precipitation to perform preventive wildfire maintenance on its rights of way, which extend about 50 feet on either side of the track, officials say.

The maintenance includes setting controlled fires in high-risk areas to eliminate overgrown ground cover, cutting back brush



Allen C. Harper,
president of the
Durango & Silverton
Narrow Gauge Railroad



The Missionary Ridge Fire reaches Vallecito Reservoir, 23 miles northeast of Durango

and, if necessary, removing volatile pine trees growing too close to the tracks.

Normally, the work takes place in the mid-to-late spring months, says Evan Buchanan, director of train operations.

But by January 2002, suspicions were already growing among weather, fire and forestry specialists that the winter's dry conditions could trigger a serious wildfire season. If that prediction held true, D&SNGRR officials reasoned, it could only increase the railroad's ever-present fire risk.

So instead of waiting for spring, D&SNGRR maintenance crews immediately began routine wildfire mitigation work.

What usually takes a month or so lasted nearly five, railroad officials say, because the crews did even more work than usual as a hedge against the wildfire forecasts. In all, about 15 miles of the highest-risk railroad right of way were treated. By May, railroad officials also began meeting with the local fire authority and with federal forest service staff to determine if extra precautions were needed.

A different type of spark arrestor was installed on each steam engine smoke stack to help reduce the size and frequency of escaping cinders, a recommendation made the previous fall by the U.S. Forest Service.

The two-person carts started hauling an attached "water wagon," which carries 300

gallons of water, a pump and 400 feet of fire hose. The water supply trailed a few minutes behind each train to quickly douse any spot fires.

Railroad maintenance crews were trained by the federal forest service in wildland fire-fighting techniques.

Train dispatchers began keeping a closer eye on weather and fire forecasts, and began documenting the predictions and trends.

The railroad purchased a diesel engine that could be used as a stopgap measure to keep the train running if the fire danger grew too high.

By this time, D&SNGRR officials were cautiously optimistic they were ready to meet the wildfire threat. They would soon find out that what they'd done still wasn't enough.

Danger and decisions

June 2002. The Missionary Ridge Fire roared to life. The fire forced the evacuation of about 2,300 homes and burned dangerously close to Durango.

By the time the fire was out 40 days later, it had claimed about 73,000 acres, 56 homes, 27 outbuildings and dealt a severe blow to the local economy through lost tourism revenue and, ultimately, jobs.

"When things started getting bad and we saw the Missionary Ridge Fire, we knew then that we were going to have trouble," Harper said. "We started taking more and more precautions. We talked to the federal forest service daily. They went out of their way to cooperate."

The railroad added special sprayers to the steam engine smoke stacks to mist the exhaust and cinders passing through the spark arrestors.

A boxcar carrying 1,000 gallons of water was added to each of the four trains that run during the summer tourist season. The boxcar, which sits behind the locomotive and coal tender car and ahead of the passenger coaches, also had firefighting equipment on board to quickly suppress any fires.

“The biggest thing I learned was to be better prepared, and we are. We are smarter. Our railroad is ready. My people are ready.”

— Allen Harper

By now, the Missionary Ridge Fire had been burning for nearly two weeks and another new wildfire, also near Durango, had begun. Fears in the community were rising, and despite the railroad’s efforts to adapt to the fire danger, pressure was mounting on Harper.

Some Durango residents called Harper and asked him to shut down the train because they were afraid it would cause fires and they could lose their homes, he says. Others supported the idea of keeping the train running.

Local businesses, some conflicted by the situation, called too. To lose the train operation, they argued, would deal a serious economic blow to the community and their trade. But so would a fire in their town — a concern that also reportedly had local officials considering legal action to force the railroad to temporarily cease operations.

Business owners in Silverton, a town of 400 that depends on the train for tourist trade, wanted the railroad to keep running. According to news accounts, some businesses were predicting they would have to close if the train stopped bringing them customers.

For the railroad itself, the jobs of about 250 D&SNGRR employees were at stake, too.

Harper found himself in an agonizing squeeze play, so he got on the train and went for a ride. That’s when he knew what he had to do.

“I was coming down Hermosa Hill and you could see the Missionary Ridge Fire on one side and then we went by a spot fire on the right of way and I said ‘we have struggled long enough,’” Harper recalled. “We made the decision to shut it down for the first time in the history of the railroad.”

Steaming ahead

Though Harper was down, he wasn’t about to be out. Determined to get back up and running, railroad officials quickly devised a new plan to get the trains back on track.

One day later, they were operational again in a scaled-back capacity. The normal 45-mile route was broken down into three segments that enabled passengers to still make the whole trip to Silverton using a combination of steam-powered train, diesel-powered train, railbus and a motor coach bus.

The steam engines were put back on the line—running only in the flat areas with ready highway access so that emergency vehicles could quickly get to a fire if one started. Passengers could ride just the steam segment or disembark at a small station and board a train pulled by a diesel engine for the second leg of the route.

The diesel, which does not emit as many burning cinders as the steam locomotive, would then make a five-mile, round-trip excursion along the High Line where the track runs along the edge of a cliff, affording a breathtaking view of the Animas River 400 feet below.

At yet another small station, passengers then could get on a bus and ride to Silverton for shopping and lunch before heading back down to Durango. Or, they could



A work crew from Fire Ready, a local fire mitigation company, was hired by the railroad to clear brush and cut trees along the right of way

The crew takes a break as No. 482 climbs Hermosa Hill



“The Durango & Silverton Narrow Gauge Railroad is a national treasure and it needs to be protected and guarded.”

— Allen Harper

take a railbus for a 12-mile side excursion through the high country. Passengers paid just \$20 for each leg — one-third of the normal \$60 ticket price for the whole ride.

Mindful of the worsening fire danger, the railroad purchased two old tank cars and in three days rebuilt them and added custom firefighting features.

Each car, which can carry 7,000 gallons of water, was equipped with water cannons that could shoot a large volume of water up to 250 feet away. The cars ran ahead of the passenger trains to wet down the right of way to minimize the chance of a fire starting from a wayward spark or ember.

Financial peril

Though Harper kept the railroad running—even through another four-day shut-down caused by a late-summer wildfire near the tracks—it was far from being financially on track for the season.

An estimated 35,000 pre-sold tickets, worth about \$1 million, had to be refunded. Harper had to release 100 seasonal employees as he struggled to make

enough money to keep his 84 full-time staff working.

“The big picture is that the Durango & Silverton Narrow Gauge Railroad is a national treasure and it needs to be protected and guarded,” Harper said. “Those 80 year-round people are family and I have to take care of them. I couldn’t just send them all home. You can’t reassemble the people who keep this railroad going. We have a great railroad and it deserves to be saved.”

Overall, Harper estimates that he lost about \$4.5 million in revenues. He spent another \$500,000 on extra gear, equipment and overtime needed for the wildfire efforts. And as of spring 2003, the cost of the wildfire mitigation measures had totaled about \$740,000.

“The train does 80 percent of its revenue in 100 days,” Harper said. “The wildfires wiped out 40 of those 100 days. It was devastating for everybody.”

The economic losses spilled over into the community as well. Business for local companies reportedly was down more 30 percent. Local governments saw a drop in sales tax revenue from the railroad’s losses.

In the early fall of 2002, with the fire risk still present, railroad officials continued wildfire mitigation efforts, hiring a local company known as Fire Ready to do more clearing and brush removal along the right of way.

Harper also bought four more old diesel engines that, when refurbished, can be used in the future to temporarily replace the steam engines in the event of an extreme fire emergency.

Through the winter, railroad crews cut firebreaks in high-risk areas and continued clearing more brush. In late spring, the annual weed-reduction program along the tracks was completed for the year.

Future of promise

Despite the hardships, railroad officials see promise in the future of the historic Durango & Silverton, a railroad that has survived other

All aboard! Pulling out of the Durango station



devastating natural and economic disasters through the years.

The 2002 wildfires taught them that it takes more than a deep passion for rare, steam-locomotive trains and an iron will to survive disaster. It takes knowledge, preparedness and adaptability.

“We went through a learning curve last year,” says Paul Schranck, D&SNGRR general manager. “Most of this stuff we implemented we hadn’t done before. But we all have a high stake in this railroad and we wanted it to work. We talked and came up with ideas. Now, we have fine-tuned these things so that we know it works well.

“Fire is something you have to constantly be aware of,” Schranck added. “You have to stay a week ahead of it. If you think you need something, have it out there. Don’t wait for something to happen.”

Harper agreed.

“The biggest thing I learned was to be better prepared,” he says, “and we are. We are smarter. Now, I’ve got the diesels. I’ll be able to run two full trains every day, even if the drought comes again. Our railroad is ready. My people are ready. Nothing will shut me down this year. I’ll keep rolling.”

No. 482 follows the twists and turns of the Animas River north to Silverton. Inside the engine, fireman Mike Nichols stokes the firebox with another 20-pound shovelful of coal to keep the iron giant steadily chugging along.

Just past Sultan Mountain, a deep ravine tightly cradles the tracks. Suddenly, the rugged terrain opens into a flat meadow where several creeks join the Animas River.

This is Silverton, once the end of the line for the railroad in its boom mining days. It is bound on all sides by the mountains—age-old keepers of the precious ore that gave life to this picturesque town.

No. 482 pulls right into the middle of town. A feast of historic Victorian buildings, now home to quaint shops and eateries, beckons passengers. For a few hours, visitors stroll down wooden boardwalks and explore the rich lode of commerce before the three-and-a-half-hour trip back to Durango.



Back on board, Caudle eases the throttle forward and the train steams toward home.

As the Durango Depot comes into view, the train slows to a hissing, steamy crawl. End of the line for this trip. ■

Evan Buchanan, director of train operations



Big Elk Fire Sends Wake-Up Call

WHEN VOLUNTEER HOLLY COYLE offered Estes Park, Colorado homeowners information about how to protect their homes from wildfire in this mountain community, she was surprised to learn that some people actually christen their plants.

“I can’t cut down Mother Juniper,” one elderly woman told her.

For Coyle and her five-member team, changing perspectives became the major challenge in the summer of 2002.

“A lot of people know about defensible space,” said Coyle, an environmental sciences and forestry major in school. “But that doesn’t mean they want to cut down a tree in their yard or even know how much they should cut back.”

Coyle is a member of the Student Conservation Association (SCA) Fire Education Corps—a national program made up of college-aged volunteers specially trained to teach people how to create defensible space around their homes and, when possible, to help them do the work.

And when homeowners are resistant to cutting vegetation away from their homes, volunteers like Coyle are taught to come up with creative solutions.

“Instead of slashing the tree, we treated ‘Mother Juniper’ as if it was an individual structure—creating a 30-foot defensible space around it,” she said. The team placed rock barriers around the tree and swept up pine needles that had accumulated beneath it.

When SCA members do an evaluation, they begin by looking at the home’s risks and vulnerabilities.

“We go over a checklist with the homeowner that covers things such as clearing out heavy fuels 30 to 100 feet from the home, fire truck access, and what type of roofing the homeowner has,” said Jenna Messmer, an SCA public information intern.

Then they provide homeowners with suggestions about how to reduce those risks. Most involve some kind of action—such as cleaning up dead pine needles or removing dead vegetation next to the home. Suggestions can include structural changes as well, such as installing a non-flammable roof.

Though the program is free and voluntary, not everyone readily embraces suggested changes. In the case of one community, it took a fire close to home to get residents’ attention.

Lessons by fire

In July 2002, the situation in Estes Park and vicinity changed dramatically when the

Alison Eckberg of the Student Conservation Association goes over the checklist for Bob Clark’s property in Estes Park



4,000-acre Big Elk Fire erupted 10 miles southeast of town.

As local officials evacuated the Little Valley and Big Elk Meadows subdivisions, firefighters from the Big Elk and Estes Park volunteer fire departments quickly assessed structures and surrounding landscapes to determine whether or not each home could survive the fire.

According to Estes Park Fire Chief Scott Dorman, homes with defensible space around them earned green flags posted prominently in driveways. Red flags were given to those properties without defensible space.

Jerry Guthrie, chief of the Big Elk Meadows Volunteer Fire Department, said the purpose of this type of sweep is to make sure firefighters don't waste valuable time and resources trying to save a house that is fundamentally indefensible.

Guthrie and his colleagues were not shy in telling residents why their homes were given red flags. The bad news left many in a state of shock.

Not one house was lost in the Big Elk Fire. But the fact that 70 percent of the homes in the subdivisions were tagged with red flags indicated to Dorman that mitigation measures were badly needed.

As the flames died down, residents streamed through the Estes Park Volunteer Fire Station wanting to find out what they could do to keep from getting red-flagged the next time. The SCA team was ready to help.

According to Coyle, the Estes Park community mantra became, "We don't want our home to burn. We don't want a red tag on our home. We want you to come out and we'll do anything you say for us to do."

SCA's phone rang off the hook, and Dorman's department—working closely with SCA—attended homeowners' meetings giving defensible space presentations throughout the summer. By the end of August, the SCA team had evaluated 164 homes.

The evaluation

Estes Park homeowner Bob Clark was one of those who called.

"We had the Big Elk Fire right behind us, just four or five miles over the ridge," Clark said.

Like many homeowners, Clark didn't know how much he should cut back and he was concerned about his roof.

"I thought they'd jump all over the fact that I have a cedar roof," he confessed when Coyle and Messmer visited his home. Clark told them he was thinking of replacing it with one made out of asphalt.

"Metal is actually best," Messmer quickly explained. "It lasts longer and it's even more fire resistant than asphalt."

Messmer and her team carefully went through a checklist of short- and long-term improvements Clark could make to create defensible space, such as cutting branches away from woodpiles or clearing pine needles from the gutter and from under porches. Long-term projects included thinning out a grove of small trees.

As part of the evaluation, Clark's street address was entered into a computerized mapping system that would tell Estes Park firefighters which homes had been evaluated. Once recommended improvements were made, an SCA volunteer would enter the new information into the system.

"You build your home in an area like Estes Park and you want to keep the trees because they are one of the reasons you moved up here in the first place," Clark said. "SCA helps you find the small things you can do to protect your home and keep the aesthetics."

Bringing in a team

Scott Sticha, the Rocky Mountain National Park fire mitigation officer in Estes Park, served as community coordinator for the SCA program in 2002.

"The Big Elk Fire was a wake-up call to this community," Sticha said. "The message about defensible space was so important. I never would have been able to do that kind of outreach without SCA."

Bringing an SCA team into a community can be costly. For a five-member team fully trained in wildland/urban interface concepts, with two vehicles, technology, housing and stipends, a community is looking at \$85,000 for one summer.

“This may sound like a lot for a community to spend, but if you compare that to the millions of tax dollars spent daily fighting wildland fires, we’re a very cost effective group,” said Jody Handly, SCA fire education corps program director.

“Some communities may not have the financial resources, but they can provide housing, vehicles, office space or other amenities,” Handly said. “The real qualification is need and the willingness to work with us.”

Agencies that have supported teams in the past include the Bureau of Indian Affairs, Bureau of Land Management, National

Park Service, U.S. Forest Service, Idaho Department of Lands, Idaho Resource Conservation and Development Councils, Anchorage Fire Department and Colorado State Forest Service. Funding for the Estes Park effort was provided by the U.S. Department of Interior.

She said grant monies are often available to fund an SCA team. She works with community coordinators to help find ways to pay for a team, either by securing grants or finding a partner willing to share costs.

“I don’t turn communities away for not having the money,” Handly said. “We work with them to try and locate supporting partners.”

Communities interested in sponsoring an SCA team in their area can apply online with the Fire Education Corps at www.thesca.org. ■



The SCA team with homeowner Bob Clark

Green Badge of Honor

More about the Big Elk Fire and home triage

UP IN COLORADO'S LITTLE VALLEY AND BIG ELK MEADOWS SUBDIVISIONS, residents kept green ribbons tied to trees in front of their houses for months as proof that their homes had passed the brutal triage that took place during the Big Elk Fire in July 2002.

"The green ribbon was like a badge of honor for people whose property was deemed defensible," said Estes Park Fire Chief Scott Dorman. "When we go through a neighborhood threatened by wildland fire, we make rapid decisions on whether we think a house is defensible or not."

Justin Dombrowski, wildland fire management officer for Boulder, Colorado, explained the firefighters' perspective.

"Basically, firefighters scout for a place to take a stand against the fire," he said. "When you talk about firefighters taking a stand, you can't take any chances. Firefighters look for fire-resistant home construction and spatial openings around a house where they can survive in that spot. We have to look at access and what kind of safety zones are available."

Despite Dorman's years of preaching defensible space to the community, and much to the dismay of many residents, 70 percent of the homes in Little Valley and Big Elk Meadows earned red flags during the triage. A red flag meant the home was not deemed defensible and that the fire department would not devote any resources to defend it.

During the triage, firefighters looked for several things to determine whether the house would get a red or green flag. The distance of the vegetation from the home, the composition of the roof and the slope of the property all were major factors in deciding whether it could be saved.

"We also looked at the density of the vegetation, the structure of the house and whether there was accessibility for fire trucks," Dorman said.

When there is a gentle slope to the property, there can be a distance of 30 feet between vegetation and the house. The steeper the slope, the further away the vegetation

needs to be. Other considerations include water availability and the kind of fire that is moving toward the property. All of these variables must be calculated within seconds as fire crews make their rapid assessments.

If a property fails just one of the criteria, it is usually red flagged. "Sometimes a special hazard also qualifies a home for a red flag," said Dorman. In one case, a property was red flagged during the Big Elk Fire because it had 18 fifty-five-gallon barrels of lacquer stored there.

Although not a single house burned in the Big Elk Fire, for days and weeks following the blaze residents streamed through the Estes Park Volunteer Fire Station to find out what they could do to keep from earning a red flag next time. "We've given a lot of advice to residents on what makes a good defensible space," Dorman said.

As time passes, Dorman is concerned that Estes Park residents may again grow indifferent to wildfire mitigation. That's why he and his crew were hard at work preaching the mitigation message even before the last green ribbon was taken down. ■



Justin Dombrowski, Wildland Fire Management Officer, city of Boulder



SCA member Emily Moss limbs a tree in Estes Park

Blazing a Trail to Safety

FOR YEARS, Paul Blumhardt has worried about fire in the woods.

That's because nearly 650 homes border the edges of those woods, full of closely grown trees, downed limbs and high-standing grasses. There's an elementary school nearby. And a few churches as well.

Blumhardt, city forester for Bismarck, North Dakota, hasn't been the only one worried. Bismarck Fire Department officials had identified those woodlands in the city's southwestern end as their primary wildfire concern.

The problem, officials said, is that there hasn't been an effective way to fight fire in those woods or to keep a blaze, pushed by frequent prevailing winds, from racing through the trees to nearby homes.

Until now.

On the cutting edge

Simply put, the solution was a trail — a 25-foot-wide swath that was carefully cleared of trees and downed limbs to create an access for fire equipment and personnel into three separate but adjacent woodland areas. In total, the three trail sections run approximately 3,700 feet.

Fortunately, said Blumhardt and Assistant Bismarck Fire Chief Kermit Schaefer, those trees have not caught fire — yet. But in recent years, there have been some sizeable fires in other forested areas around Bismarck, a city of 55,392 flanked by aging woodlands that begin on the banks of the nearby Missouri River.

Drought conditions in 2001 and 2002 increased the risk and incidence of fire, drying out the stands of cottonwoods, green ash and box elder. A severe windstorm in July 2001 took its toll on the green ash and box elder, downing many limbs and trees already weakened by decay and disease. And the floor of the woods grew thick with tall brome grass, now tinder dry.

That's why Blumhardt was so intent on finding a way to make the project a reality. A lack of funding to pay for the work had been standing in his way.

But in early 2002, the North Dakota Forest Service helped change all that.

The agency was offering special cost-share grants to pay for projects that help reduce wildfire risks to communities. The U.S. Forest Service allocated the money to North Dakota through the National Fire Plan. The money is administered by the state forestry agency.

It was just the help Blumhardt had been looking for. He applied for funding to help construct the trail — one of three phases of this wildfire prevention project — and in August 2002, a grant for \$10,158 was awarded. The city spent an additional \$4,255 in cash and in-kind services for the project match.

The real work begins

Next, Assistant City Forester Jeff Heintz went to work to design the trail system. Access points were needed in three sections of contiguous woodlands, all of which border subdivisions of mobile homes, apartments, condominiums and single-family dwellings.

Heintz not only wanted to create adequate access, but also preserve the city-owned woodlands and the privacy those trees offered the adjacent homeowners.

Before clearing work began, dead brush and branches lay deep behind Tatley Meadows





A finished section of fire trail, its edge marked by the orange-tipped stake

So he crafted a meandering trail through the woods, leaving a 150-foot-wide buffer of trees between the homes and the trail. The curving shape of the trail was designed to make it look more natural and to discourage everyday traffic from driving into the woods.

Each tree to be removed was individually marked and strict guidelines were put in place so that no adjacent trees would be damaged in the process of creating the trail.

The city then contracted with a local tree service to construct the trail. To do that, tree specialists cut trees and dead limbs, hauled out the downed timber, and cleared the trail's dirt surface of small stumps and tree debris.

The access path, known after it was built simply as "the fire trail," was completed in just eight days in early January 2003. The project received high marks from local officials and nearby residents.

"I'm just so pleased to have that trail in there," said Blumhardt. "The lack of access is something that has really bothered me for a long time. Now if there is a fire in the woods, the fire department can get in and knock it down before those homes are threatened."

Schaefer agreed.

"Before, we had absolutely zero access into that area with our brush trucks, and minimal access for firefighters on foot," he said. "If a fire had started, we would have had to fight it

from the perimeter of the trees and let things burn. We knew we could mount a defense, but that would have been it. We weren't going to be able to attack the fire offensively.

"Now, the trail is going to give us both an access point to get in there and a firebreak to slow fire down," Schaefer added. "We are more apt to control the fire now than ever before. The fire will not control us."

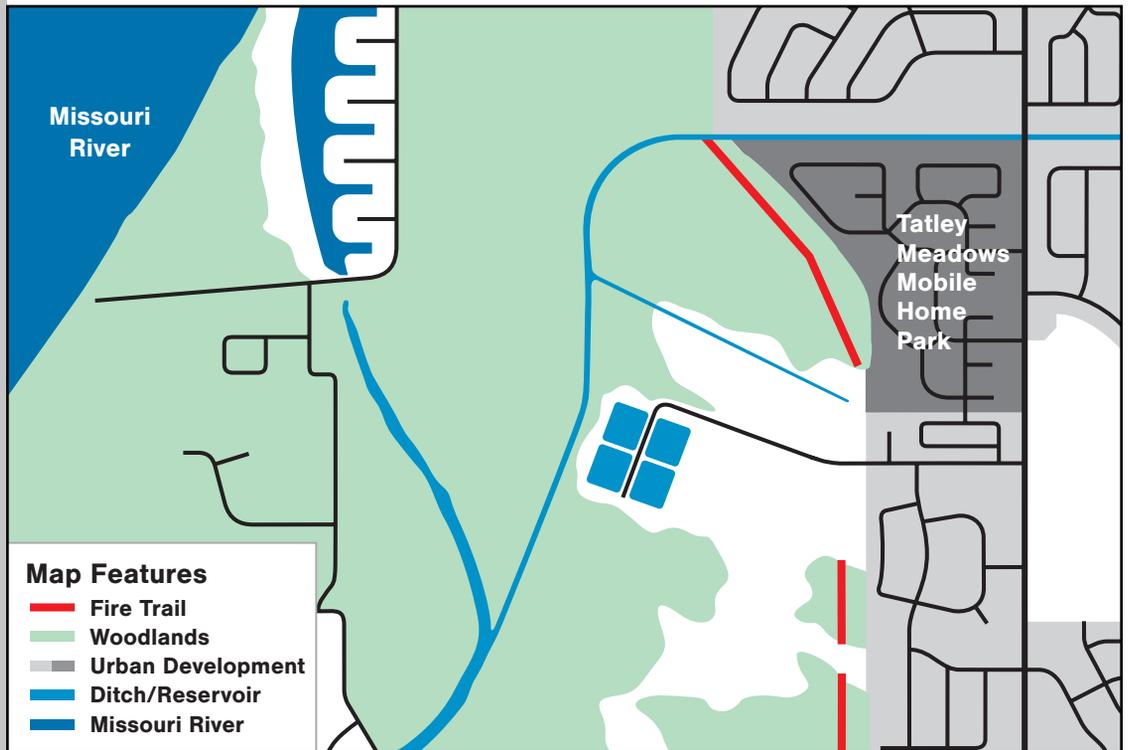
Homeowners see benefits

For Marvin and Marion Suess, whose property is adjacent to the middle trail section, the firebreak was a welcomed sight. Children often go into the area to play, they said, sometimes building makeshift forts and occasionally starting small bonfires.

One such fire, in the summer of 1998, was small enough that firefighters could put it out using fire extinguishers, Marvin Suess said. But it took extra time for firefighters to get to the fire, he added, noting that they initially tried to gain access through a neighbor's property and couldn't get through.

"Our concern has always been kids that might start a bonfire and it would get out of control," said Marvin Suess. "There's a lot of dead wood back there. All that dead [brome] grass back there, that stuff burns like gas.

"This trail is a great idea," he added. "The only way the fire department could get in



Map of the Bismarck Fire Trail and surrounding area

there before is with a fire extinguisher or have a heck of a lot of hose. Now it will give them an opportunity to get in there quick and douse a fire.”

To help stop the spread of fire, Suess said he and many of his neighbors regularly mow a wide strip of the brome grass beyond their property lines to create their own firebreaks.

Jeff Avery has lived in the Tatley Meadows Mobile Home Park for 12 years. The longest piece of the trail now runs behind his home. Because of the buffer zone, the trail is barely visible. But it is a relief to know it’s there, he said.

“We lose a lot of trees every year just because of the high winds we have here,” Avery said. “There’s a lot of dead stuff back there. Fire has been a concern for me because we are so close to the wooded area, especially as dry as it’s been the last couple of years.”

Avery and some of his neighbors also regularly mow beyond their property lines to keep down the tinder brome grass, he said.

Tatley Meadows park officials said that of the 357 homes in the park, about 10 percent of them border the woodlands. But Blumhardt and Schaefer both consider the entire park at risk if there were a fire in the woods, because of the dense population, the proximity of the trees to the homes and the possibility that

strong winds could blow hot embers into the neighborhood.

Future efforts planned

Though the trail construction was the primary concern, both Blumhardt and Schaefer said more work remains to be done before the project is considered complete.

Local officials are planning a public education campaign for the residents of all three areas to teach them about the dangers of wildfires and how to better protect their homes. The campaign will discourage residents from dumping lawn clippings, storing firewood and, in the case of youngsters, building forts in the wooded area. All have been a problem in recent years.

Blumhardt is eager to secure additional funding to clear out the downed timber in the buffer zone between the trail and the residences. Both he and Schaefer agree that the fire danger will remain high until that phase of the project is complete, especially if the current dry cycle continues well into 2003, as predicted.

With hundreds of woodland acres bordering the city’s limits, Blumhardt and Schaefer agree that more trails are needed. For now, though, they’ve taken a giant first step in managing wildfire for the city on the river. ■

FOR OTHER COMMUNITIES with wildland/urban interface areas, Bismarck City Forester Paul Blumhardt and Assistant Bismarck Fire Chief Kermit Schaefer offered these suggestions to be better prepared for wildfires:

- ✓ **Review past wildland fire incidents** from an operational standpoint. Were there issues with access, firefighter safety or inadequate equipment? Talk to the front-line firefighters (post-incident analysis) to get their perspective on what worked, what didn't and what would make a similar incident go better in the future.
- ✓ **Build a resource team** from among other city departments or agencies. Meet regularly to share issues, ideas and to establish working relationships before you need them. There's strength—and solutions—in numbers. If needed, tap into the expertise available from county, state and federal agencies.
- ✓ **Do a risk assessment.** Are there sizeable woodland or grassland areas in and around the city? (Wildfires aren't confined to

just mountainous forests.) If there were a fire in one of those areas, could it pose a problem to people and property? Include your city's worst-case wildfire scenarios in the assessment process. For cities without a local forester, tap into state and federal forestry agencies for advice on risks and solutions.

- ✓ **Be open to creative solutions.** Let the sky be the limit when you look at ways to solve the problem. Think beyond what you know and imagine what is possible.
- ✓ **Explore funding sources,** both from other government agencies and the private sector. Don't let a lack of money stand in the way of implementing a solution.
- ✓ **Communicate and educate.** Let others know what you're doing, why the project is needed and what they can do to be part of the solution. Target audiences should include internal staff, other city departments, local officials and the general public. Consider post-project updates to show how the solution is working or if more still needs to be done. ■



Teamwork Fuels a Modern Gold Strike

IN THE MID-1800S, Virginia City and Nevada City, Montana, were among countless western towns born from the rush for gold.

Exhaustive historic preservation efforts on more than 200 buildings and about one million artifacts have kept these two frontier mining towns on the map since then.

Today, it's all virtually priceless for many reasons. The area is rich with history of the Montana territory. Together, the towns represent the largest assemblage of remaining gold-rush era buildings in the country. This western Americana collection is second in size only to one at the Smithsonian Institution in Washington, D.C.

But these treasures also are at great risk from wildfire.

The buildings are wooden and old. The towns are clustered along the bottom of a canyon, with adjacent wildlands and sagebrush-dotted grassland. Prevailing winds could bring a fire to their doorsteps in a flash.

That's why state historic preservationists are mounting an aggressive defense to help keep wildfire from claiming the last of Montana's wild frontier.

To do that, they're parlaying ingenuity, partnerships, money and hard work into a wealth of opportunity.

Revisiting the past

Protecting the past from the fires of the future began in 1998, just months after the state of Montana purchased the buildings, land

and artifacts in both towns for \$6.5 million. Collectively, they are now worth an estimated \$20 million.

A Montana family had owned the properties since the 1940s and done much of the restoration and collection of artifacts—some, like a rare French organ, are one-of-a-kind.

But in recent years, proper upkeep of the buildings and landscape had become increasingly difficult.

So the state bought 248 buildings in both towns, 160 acres of land and the artifacts—all with an eye toward preserving a valuable part of Montana's heritage. Simultaneously, the legislature established the Montana Heritage Preservation and Development Commission to acquire and manage these and other revenue-sustaining historic properties on the state's behalf.

To commission staff, the fire danger was immediately evident. Thick, overgrown vegetation was everywhere. Cedar-shingle roofs on many of the buildings were so dry that one spark could have lit them like a torch. In Nevada City, there was no effective water supply to fight a fire, leaving the town and its lone occupant virtually defenseless.

The priorities were clear, says Jeff Tiberi, Heritage Commission executive director. The fuel load had to be reduced, and fire-suppression capabilities had to be improved.

"The first thing we did was to go out and buy a [fire department] water tender that the City of Great Falls was surplus," Tiberi said. "That gave the Virginia City Volunteer Fire Department a way to haul a large amount of water, which is especially important for Nevada City."

The commission was able to purchase the 1973 truck, which holds 3,500 gallons of water, for \$10,000 in state funds. Then, it was able to purchase portable radios that can provide direct communications between the local fire department and key commission staff in the event of a fire.

But Tiberi knew that these first steps were only the beginning of the "needs" list.

Alder Gulch,
Nevada City, 1899



“We had already done some things [to guard against wildfires] but we didn’t work on it vigorously until the 2000 fires happened.”

— Jeff Tiberi

Besides catching up with 20 years of deferred general maintenance, the wildfire threat was ever present. New ideas and resources were needed.

Building a network

So Tiberi began weaving a network of experts, labor and funding that could help develop a game plan and take action to better protect the towns.

“Our initial approach was to work with the Virginia City fire department because we knew they were going to be the front-line people,” Tiberi said. “They recognized how critical the situation was and gave us suggestions on fire protection.”

Tiberi also organized a working group of fire experts that included firefighters and officers from the Virginia City, Helena and Great Falls fire departments, the State Fire Marshal’s Office and others.

“We went to these people and said ‘the state has invested a considerable amount of money in this and we need your help. What’s the best thing we can do to protect these things?’” Tiberi recalls.

The group, which continues to serve in an advisory capacity, did an overall assessment of the towns and prepared reports outlining recommended actions.

Tiberi then turned to his state agency counterparts for assessments and recommendations. The risk management division looked at potential safety and liability issues for a number of hazards. State electrical inspectors evaluated the wiring in the buildings with power to assess electrical condition and safety.

Federal resources, such as the Bureau of Land Management (BLM), the U.S. Forest Service and the National Park Service were tapped as well.

With the ideas flowing, the next critical issue was money. Again, through Tiberi’s network of experts, potential funding sources started popping up.

So did a virtual bombshell.



Season of fire

It was the summer of 2000. Unprecedented wildfires had ravaged much of Montana for months. By October, when the smoke had cleared, nearly one million acres throughout the state had burned.

“We had some very significant fires that could have totally destroyed these towns if they had gotten closer,” Tiberi noted. “Some days, there was so much black smoke in the sky that it looked almost like a nuclear explosion. It was terrifying at times.”

Though wildfires never got close enough to either town to pose an imminent threat, Tiberi says the smoke from those fires did, virtually shutting them both down for a month at the height of tourist season. Economic losses were estimated at \$50,000.

A steam-powered train that ferries visitors between Virginia City and Nevada City, located a little more than a mile apart, had to be temporarily suspended because of the dry conditions and high fire danger.

“Those wildfires were a wake-up call for us,” Tiberi says. “Walking around that town, almost like a ghost town with all that smoke in there, you think, ‘boy, we could lose everything here.’ It was a pretty sobering thought. And when you think about your responsibility, not only to the past 140 years but to the future 140 years, you know you have to do something.”

Jackson Street, Virginia City, in the 1860s

A member of AmeriCorps' Montana Conservation Corps pulls up knapweed in Virginia City



As a result, work priorities shifted.

“We had already done some things [to guard against wildfires] but we didn’t work on it vigorously until the 2000 fires happened,” he added. “It quickly moved our wildfire mitigation projects to the front burner.”

The issue of funding jumped to the forefront as well.

The commission stepped up its efforts to secure grants from a number of sources—most of which were discovered by Tiberi’s growing network of experts, which now included state and federal emergency management agencies.

The result resembles a modern-day gold strike.

Since 2000, the commission has been able to secure a \$59,000 grant from BLM, a \$300,000 “Save America’s Treasure” (SAT) grant for Virginia City from the National Park Service, and a \$60,735 hazard mitigation grant from the Montana Division of Disaster and Emergency Services. Mitigation grant money is made available to the state by the Federal Emergency Management Agency (FEMA).

Virginia City, the current county seat, was eligible for a SAT grant because it is a designated National Historic Landmark District.

All grants, which fund a variety of fire and wildfire mitigation actions, have cost-share matches that the commission is meeting with state dollars, donations and in-kind services.

Safety solutions

Getting the most effective fire protection for both Virginia City and Nevada City, involves more than one swift, decisive action, Tiberi has learned. It takes a combination of solutions.

By spring 2003, a lot of work had been accomplished and still more was planned. These efforts include:

Managing flammable fuels

To keep a wildfire from spreading both into the towns and to the buildings, vegetation and other flammable fuels need to be managed.

To do that, the thick, overgrown vegetation near or around structures in both towns has been carefully thinned or completely removed, according to Randy Kleindorfer, commission operations chief and Virginia City volunteer fire chief.

Surrounding lands, replete with sagebrush and knapweed—both considered dangerous, “flashy” (highly flammable) fuels—have been aggressively treated. Acres of sagebrush have been thinned or removed with an eye toward reducing fire spread and preserving the landscape in a more manageable state.

In outlying areas, aerial and ground-level chemical spraying has been used to eliminate the prolific knapweed, which Kleindorfer describes “like a wildfire itself.” In Virginia City—home to 140 year-round residents—the weeds have been pulled by hand to avoid the chemical exposure.

The commission also has purchased a chipper to recycle the removed brush and is actively encouraging Virginia City residents to thin vegetation around their homes as well, offering the use of the chipper to help with brush disposal, Tiberi says.

In the heart of Virginia City near the historic district, loads of downed, storm-damaged trees and branches have been removed to keep from feeding a ground-level fire.

In both towns, large piles of old lumber that had been left lying up against buildings have now been re-stacked some distance away to eliminate a secondary fuel load.

The majority of the fuels work has been done over two seasons by crews from the Montana Conservation Corps, an organization that enables young adults to build life skills, while improving the environment and local communities.

Funding for the projects came from part of the BLM grant, from part of the SAT grant and from the Montana Noxious Weed Trust Fund. Additional work was slated for spring/summer of 2003.

Improving water capabilities

Without question, one of the greatest shortcomings of the wildfire protection

efforts was the lack of water to fight a fire. So the commission embarked on a multi-phase project to establish a reliable and effective water supply.

In Nevada City, there was only one possible water source that was close enough to effectively protect 100 buildings—a huge, creek-fed pond, left over from a decades-old gold-dredging operation. But a state highway separates the water from the town, with no way to bridge the two.

So the commission hired contractors to horizontally bore deep underneath the highway and lay 2,000 feet of 6-inch water main. They added a 1,000-gpm, diesel-powered irrigation pump that can be fired up, as needed, to move water through the line and feed four hydrants that were installed at key locations within Nevada City. A fifth hydrant was installed between the pump and the water main to direct the water into the hydrant system.

In the summer of 2003, two more hydrants were scheduled for installation to complete the system. Plans also include drilling a well to provide a secondary water source. A new, three-phase electric pump will be installed and used to move water from that well.

In addition, a sprinkler system will be installed along Nevada City's perimeter. The sprinklers will be used to water adjacent ground-level vegetation, creating a 40-foot green area between the grasslands and the town that can serve as a defensible space.

If a wildfire threatens, the sprinklers can be activated to produce a water curtain to help keep flames from advancing into the town. To avoid potential archeological issues, the sprinkler system will lie on top of the ground during spring, summer and fall months. The piping will be drained, removed, and stored during the winter to avoid freezing.

The 2003 water projects are being funded with the state/FEMA hazard mitigation grant.

Virginia City's water supply is well-established. However, there are some hard-to-reach



A worker connects the water feeder line to one of the pressure fire hydrants installed in Virginia City

areas, primarily in two narrow alleyways behind more than a block of side-by-side buildings, where mounting a fire defense has not been possible.

To fix the problem, a total of five additional hydrants are being installed in the alleyways. In addition, three portable “water cannons” are being purchased. Both projects will be funded by the SAT grant.

The “cannons,” one for each alleyway, can be put on the ground, hooked to a hydrant, and shoot large streams of water to protect the buildings and fight oncoming fire. The third cannon will be housed at the fire department and used where needed.

Reducing roof vulnerability

In a wildland/urban interface, a structure's roof can be among the most vulnerable areas. Wildfires easily produce flaming embers that can travel airborne for more than a mile. Often, they land on, and ignite, roofs.

In both towns, most of the roofs are covered with cedar shingles, a virtual hotbed for embers. Over the years, many of the shingles had blown off, dried out or decayed.

So 70 buildings have been re-roofed, using cedar shingles treated with a fire retardant. That combination both preserves the historic integrity and offers a degree of fire resistance.

For even more protection, 1/2-inch dry-wall was added above the sheeting so that if a roof did catch fire, it would help hold back the flames for a period of time. That gives firefighters a better chance of keeping the fire from spreading inside, damaging the structure and its artifacts.

More work was planned for the summer of 2003. A fire-retardant chemical was scheduled



A completed pressure hydrant at the end of a newly filled water line ditch in Virginia City

to be applied to cedar shingles on existing roofs of a number of other historically significant buildings in both towns to afford better fire protection.

'Fire Awareness Day'

The Virginia City Volunteer Fire Department hosts an annual "Fire Awareness Day." The event is open to the public. A variety of experts provide wildfire prevention and noxious weed control information to residents. Area fire departments are invited to tour the town, enabling firefighters to become familiar with the town's physical layout and the specialized strategies needed to fight a fire there in the event they are called upon to help in the future.

Reducing additional fire threats

Though wildfire remains a major risk, so does the possibility of a fire starting from other sources.

To address those risks, the commission has had electrical wiring in several key buildings — such as an Opera House, two hotels, a large restaurant and a historic home — upgraded to meet current safety codes.

The commission has aggressively posted "No Smoking" signage throughout both towns to help educate the more than 70,000 annual visitors. Smoking in Virginia City's historic public areas is prohibited by local ordinance.

As a backup to the signage, pea gravel has been added between the slats of the town's boardwalks to prevent a discarded cigarette from dropping into a crack and starting the wood walkways along the buildings on fire.

In addition, fire detection and alarm systems for the buildings are being installed,

as funding becomes available, to give the fire department better defense capabilities through early notification.

Lessons learned

Tiberi credits the fire-protection improvements largely to the network of resources the commission has been able to establish.

"The success of these things is finding and building bridges among all these different entities," Tiberi says. "It's also important to maintain these bridges, which takes a considerable amount of effort but it's certainly worth it in the long run."

The same formula for success holds true in securing project funding, Tiberi adds, which has been "a godsend" for the historic towns.

"We learned about a lot of these grants through e-mail notifications from many of our partners," Tiberi explains. "You have to become aware of these grant programs and deadlines, and make time for your staff to follow up on them. The grant world is very competitive but if you have a good product and a good need, you will rise to the top."

Though current and future mitigation efforts will greatly improve the towns' chances of surviving a wildfire, both Tiberi and Kleindorfer say their work will never be done.

"We're a whole lot better off now than when we started," Kleindorfer says. "We have reduced the fuel loads. We've got way more equipment now to help fight a fire. We've treated shingles on these buildings. We've created defensible spaces. And there's a lot more public awareness. But we're not going to stop. We have to keep going."

Says Tiberi, "The lesson we are learning now is that this [mitigation] is a process. It is not a destination. Fire will always be a danger. You always have to look at new technology and experiment a little. You can't let mitigation move to the back burner. The future of any historical site can change in a matter of moments." ■

'Don't Burn the Rally'

Fire-Prevention Campaign Hits the Mark

FOR A WEEK EACH AUGUST, the Black Hills of South Dakota become the heart and soul of what some term the “largest free-wheeling motorcycle rally in the world.”

In short, it's known as “Sturgis,” named for the small town where motorcycle enthusiasts have gathered for more than 60 years to ride and race amid some of the most beautiful scenery in the country.

But for the 2002 Sturgis Motorcycle Rally, a dangerous threat was lurking at every turn. That threat was wildfire. And it had local, state and federal fire and forestry officials worried.

The rally draws hundreds of thousands of motorcyclists, who traverse the rolling, forested “Hills” and beyond. There are thousands more non-rally visitors. And in the midst of it all stands the 1.2-million-acre Black Hills National Forest.

In the summer of 2002, South Dakota was in its third consecutive year of drought. Already, there had been several wildfires, one of which devastated nearly 11,000 wooded acres and came within a whisker of burning the town of Deadwood, another favorite spot of rallygoers.

Combined, the expected half-million visitors and tinder-dry conditions meant one thing: a disaster was waiting to happen.

“With the fire conditions that were present, one ignition could have brought another catastrophic fire,” said Joe Lowe, coordinator for the South Dakota Wildland Fire Suppression Division, a state agency charged with wildland fire suppression, training, education, and prevention. “And with a large number of people in the Hills, it would have presented us with major evacuation problems.”



Main Street,
Sturgis, South Dakota



Damage from the Grizzly Gulch Fire reminded riders to be careful

Taking the offensive

So the South Dakota Interagency Fire Council, a consortium of fire, forestry and land management agencies, took the offensive. In July, the state's governor imposed fire restrictions. That meant a ban on all open flame; restricting smoking to inside vehicles, buildings or designated areas; and requiring spark-arrestors on all motorized vehicles traveling off-road.



Still, there was the issue of how to deal with so many out-of-state visitors unfamiliar with the extreme fire danger. It was clear, officials said, that a massive public education effort was needed as well.

Black Hills National Forest officials turned to the National Interagency Fire Center in Boise, Idaho, for help. With local resources already stretched thin, officials wanted a national wildfire prevention and education team to come to South Dakota and develop, implement and manage a fire-prevention campaign for the Black Hills and the rally.

It was a daunting task with a short timeline. Four specialists in the areas of fire prevention, education and communications from Alaska, California and Utah were quickly handpicked to form the team. Two specialists from the South Dakota Wildland Fire Suppression Division were added as local liaisons.

With the rally just one week away, the team first met with area fire and forestry officials to establish objectives that would meet the overall goal of reducing the incidence of human-caused fires.

In the Black Hills National Forest alone, people cause half of all fires and the problem is growing, according to Dean Berger, the forest's fire management officer. Adding a large influx of people would increase the already high risk exponentially, Berger reasoned.

Embarking on a campaign

So a multi-faceted campaign was developed, centering on the theme, "Don't Burn the Rally." Key elements involved an extensive public outreach program and 10 roving fire patrols that could keep a watchful eye on conditions and quickly suppress any fires that did start.

Now the question became: how to really get people's attention so that the fire prevention message would sink in. The team needed something that was both eye-catching and lasting.

So team leader Bud Rotroff went looking for something that would be symbolic of the

rally. That's when he found Al Rieman, president of Black Hills Harley-Davidson.

Just two weeks earlier, Harley-Davidson had unveiled its new 2003 model-year motorcycles, specially designed to commemorate the manufacturer's 100th anniversary. Everyone had been waiting to see them. And Rieman had just gotten one.

Sharing the concern about a potential wild-fire, Rieman readily agreed to let the team photograph the motorcycle for a poster that would sport the rally theme. To round out the image, team members recruited a Sturgis firefighter and Smokey Bear, and set them all against a scenic Black Hills backdrop.

With that, the face of the rally's fire-prevention campaign was born. And within 72 hours, 1,500 of the special posters were hitting the streets, along with thousands of other signs, brochures, stickers, placemats, Smokey Bear pins, bandanas and other fire-prevention pieces.

Patrolling for fires

By then, the fire patrols were also at full throttle. Considered one of the most critical elements of the campaign, the patrols were used to talk to the public about the fire danger, to hand out prevention materials, and to detect and extinguish fires.

Each patrol, working a 12-hour daily shift, consisted of a fire truck and two or three volunteer firefighters rotating from among 36 Black Hills fire departments. Those units traveled to towns, campgrounds, picnic areas, and wooded areas—where many bikers are known to camp—to check on conditions and to talk about the fire danger and prevention.

In addition, three volunteer fire departments in strategic areas staffed their stations 'round-the-clock for 10 days, augmenting the Black Hills National Forest's 26 full-time fire-fighting units and other local fire department efforts.

Again, the goal was to provide a faster response to fires and other emergencies. It was a formula that proved effective when firefighters were able to quickly extinguish a few small



Left to right: Sturgis Fire Chief Ron Koan discusses fire patrol effort with Joe Lowe and Dean Berger

fires during the rally that started from lightning strikes.

"The public's reaction to the patrols was really positive," said LaVerne Hermanson, patrol coordinator and one of the team's local liaisons. "They were out there and visible every day, which made people think. The firefighters felt a great sense of accomplishment, too."

Public outreach

The story was the same in downtown Sturgis, which forms the hub of the rally, according to Beth Adam, team liaison and public information officer for the State Wildland Fire Suppression Division.

There, rallygoers were very receptive to information about fire safety and prevention, said Adam, who set up and helped staff a booth as part of the campaign's public outreach.

Smokey and the 2002 Sturgis Motorcycle Rally National Fire Prevention Team





Bill Bell hands out Smokey bandanas and fire prevention materials to bikers entering Custer State Park

“Education is definitely the key,” she said. “The awareness has been tremendous this year. People were very respectful of the fire ban. I heard very few complaints about not having a campfire. They were seeing the damage that the Grizzly Gulch and Little Elk wildfires in this area had already done and they understood why we were concerned.”

By the end of the 10-day campaign, there were few places the message hadn’t reached. Signs, posters and brochures could be seen in campgrounds, businesses, state and federal parks, and other public gathering places throughout the Black Hills.

Local media ran stories and public service announcements promoting fire prevention. Shopping mall marquees flashed the rally theme. A Web site carried up-to-date information on both the fire restrictions and prevention measures.

In all, more than 34,000 fire-prevention pieces were handed out and more than 10,000 personal contacts were made, team officials report.

Hitting the mark

It is exactly that effort—and the cooperation of rallygoers—that fire officials point to as the reason the 2002 rally closed with one remarkable statistic: no major human-caused fires, despite an estimated attendance of nearly 500,000.

“It’s a success story,” Lowe said. “I expected there to be fire starts and we didn’t have any. Without this campaign and everyone’s efforts,

I think we would have had a lot more human-caused fires because people would not have been responsible for their actions and adhered to the burn ban that had been put in place.”

John Twiss, forest supervisor for the Black Hills National Forest, was impressed by the campaign as well.

“The results were excellent,” said Twiss. “When it’s that dry and you have that many people in the forest, we had the potential to have forest fires and we didn’t. I really attribute a lot of that to the prevention effort that went on there and the innovative approach they took.”

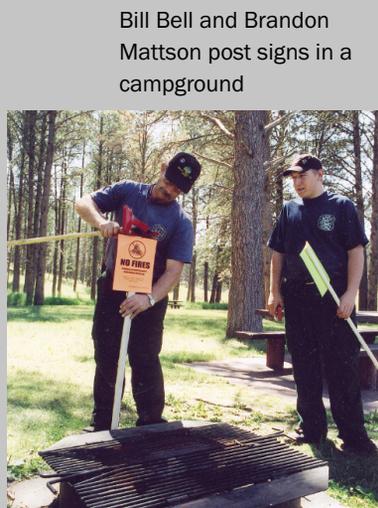
Berger agreed, noting that the \$100,000 price tag for the team, the patrols and the prevention materials was well worth the cost. The project was funded by the U.S. Forest Service through a special appropriation available when extreme fire conditions and threats exist.

“Human-caused fires generally are the most expensive on fire-suppression costs and damage,” Berger said. “They often cost \$1 million or more,” he added, citing the \$10 million to \$12 million cost of the 2000 Jasper Fire that burned 86,000 acres in the southern Black Hills, as an example.

For the 2002 Grizzly Gulch Fire in Deadwood, which preceded the rally by just a month, suppression costs alone were estimated to be more than \$7 million. Businesses there reportedly lost in revenue another \$2.8 million in the nearly three days the town was evacuated. That revenue loss now approaches a reported \$10 million.

Dollars and cents notwithstanding, the real savings is in protecting human life and property, officials agree.

“What this team did is amazing,” said Berger. “In a short period of time, we educated a tremendous number of people, including those who live in the Black Hills year-round. If this effort even prevented one major fire, not only in the Black Hills but elsewhere in the country because of what people learned, it was well worth it.” ■



Bill Bell and Brandon Mattson post signs in a campground

Partners in Prevention

Putting a Face on the Rally

More about the
Sturgis Rally:
Creating the poster

TALK TO JUST ABOUT ANYONE who lives or works in the Black Hills of South Dakota, and one common theme emerges: it is not just a scenic area dominated by a sprawling federal forest. It is where people live. It is where people play. It is who they are.

So when devastating wildfires hit the “Hills” in the summer of 2002, it wasn’t just someone else’s problem. It was personal. Vigilance soared. And so did the fear of more fires.

It was hot. It was dry. And nearly 500,000 motorcyclists were coming to the Hills for the Sturgis Motorcycle Rally, a weeklong event of riding and racing held every August.

That fear put fire-prevention efforts front and center. And it helped to build a unique

public-private partnership that set out to make a difference.

The objective was to create and produce a symbolic image that would capture the attention of rallygoers and convey an all-important message: “Don’t Burn the Rally.”

The message had been developed by a national wildfire prevention and education team, brought to South Dakota at the request of Black Hills National Forest officials to create and execute a public fire education campaign for area visitors.

It just so happens that the majority of those visitors were a unique audience—motorcyclists. So team members began brainstorming. An idea began to form. And the hunt for help was on.

Al Rieman, president
of Black Hills Harley-
Davidson





Maury LaRue, firefighter and photographer

The hunt for help

The team needed something visual that could tie the prevention message to the rally. And they needed it fast. The rally was beginning the next day. That's when team leader Bud Rotroff found Al Rieman.

Rieman is the president of Black Hills Harley-Davidson, a motorcycle dealership with stores in Rapid City and Sturgis, the heart of the rally. He was born and reared in the Black Hills. And he knew only too well that danger was never far away.

"Living here, our awareness was quite high," said Rieman. "Every day, you would kind of scan the horizon looking for telltale signs of fire. These are our Hills. And if there is danger to the Hills, we take it personally. It's not like, 'Well, the government forest is going to burn down.' It would be like setting fire to my garage."

Collaboratively, Rieman and the team hit on the idea of incorporating a motorcycle into the image that would be used to sell the fire-prevention theme.

And Rieman had just the bike in mind—a 2003 FLHTC Dresser, one of three models made specially to commemorate the manufacturer's 100th anniversary.

Harley-Davidson was set to publicly unveil the special models at the rally. Everyone was waiting to see them. Rieman knew that

anything showing one of those motorcycles would attract attention.

"People coming in for the rally wouldn't necessarily know how volatile our situation was," Rieman said. "It was going to be very important to get them to take steps to help protect our area. That's why we picked a motorcycle that would get people's attention. We were hoping to get people to stop, read the message, and think."

Ideas then started to fly among the team on how to tie in the other key elements of the theme—fire, prevention and the Black Hills—and on what the final product would be.

Suddenly, it became clear that one more important component was needed: someone to take the picture. It was no small task. This image would be seen all around the Hills. It would be "the face" of the rally fire-prevention campaign.

It didn't take long to find a solution. Sturgis volunteer firefighters Maury LaRue and Tom Monahan happened to be professional photographers and owners of T&M Photographic Studio in Sturgis. They were eager to help.

"As professional photographers, we thought we could create a good image," said LaRue. "As professional firefighters, it was our calling to do this."

At the same time, Rotroff enlisted the help and support of the Sturgis Area Chamber of Commerce. The chamber got on board immediately, offering financial support and free use of the official rally logo, which the chamber owns and normally charges a licensing fee to use.

Creating an image

By the next afternoon, the key elements of the image had been chosen and the photo shoot was under way. The final grouping featured the 2003 Harley, representing the rally; a Sturgis firefighter, representing the fire element; and Smokey Bear, universal symbol of fire prevention—all set against a scenic Black Hills backdrop.

By now, it also had been decided that the image would become a four-color poster. So the team enlisted the help of Jackie Twiss, a graphic artist on staff with the Black Hills National Forest, who quickly pulled together a design.

Now to find a printer, especially one who would be willing to pay for production and could provide a quick turnaround. The week-long rally was already two days old.

Rieman recommended Fenske Media Corporation, a commercial printing company in Rapid City that had done some work for the dealership and had very high-tech capabilities. So Rotroff went hunting again. And again, the answer was an emphatic “yes.”

Getting ahead of disaster

Dave Fenske, president of the family-owned business, has seen the devastation disasters can cause. The printing company has designed and produced books for clients in several states chronicling the effects of floods, tornadoes and wildfires.

“The rally is a big function of the Hills,” said Fenske, one of four brothers who own the company. “We were all very aware of the fire situation that was going on here this summer. We want to preserve the forest around



Paul Minor, executive director of the Sturgis Area Chamber of Commerce



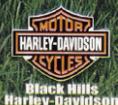
The photo shoot

Don't Burn The Rally!



T&M Photography
LaRue Monahan

REMEMBER Only you...



The finished poster

us and be proactive. And this poster was an opportunity for us to get involved this time ahead of a disaster.”

Two team members and Twiss met with Fenske graphics staff to put the finishing touches on the poster design.

Just two hours later, a proof copy of the poster was ready. By the next morning, 500 of the final version were already printed and out the door. Another 1,000 posters soon followed.

Within hours, the posters were being put up in businesses and public gathering places throughout the Black Hills. The reception was overwhelmingly positive.

“Every business I went into was supportive,” said Paul Minor, executive director

of the Sturgis Area Chamber of Commerce, who helped with distribution. “In fact, I had businesses making room in their windows and moving other posters to put this one up. People on the streets were even hitting me up for copies.”

The results were positive too. Fire and forestry officials reported no major human-caused fires during the rally. Credit was given to the team’s public fire-prevention education campaign, of which the poster was a major element.

From conception to production, the poster came to life in a scant 3½ days, Rotroff said, largely because of the strong public-private partnership that came together in the name of fire prevention.

“This poster demonstrates how communities can get together to accomplish a common goal,” Rotroff added. “Without the cooperation of all our partners, especially the businesses, we couldn’t have done this.”

The estimated \$10,000 cost was underwritten financially and through in-kind services by Black Hills Harley-Davidson, T&M Photographic Studio, Fenske Media Corporation, Sturgis Area Chamber of Commerce and the South Dakota Interagency Fire Council, a consortium of fire, forestry and land management agencies.

It was an effort that all partners said they would do again if the need is there.

“This is a story of how fires can be avoided because a dime spent on prevention can save a dollar in cost,” said Dave Fenske. “We appreciated the team’s efforts of getting ahead of the fires and we were proud to be a part of it.”

Minor agreed. “The poster was really successful. It definitely caught people’s attention. In fact, it actually became a collector’s item. By the end of the rally, they had virtually disappeared.

“But then,” he added, “with Smokey Bear, the firefighter, the motorcycle and the Black Hills in the background, how can you forget a message like that?” ■

On Patrol

Keeping the Forest Safe from Fire

More about the
Sturgis Rally:
A day with the patrol

08:45 A.M. — **MAURY LARUE STARTS HIS FINAL CHECK** of a shiny, red quick-attack fire truck and its contents. Shovels. Hand tools. Boots. Helmet. Nomex jacket. Gloves. Smokey Bear stuff. It's all there. He starts the truck's pump to make sure it will flow water if needed. That's OK too. Now he is set. Another day of fire patrol is about to begin.

LaRue, 55, is a firefighter with the Sturgis Volunteer Fire Department in South Dakota. He has been patrolling for days. So far, it has gone fairly well. But it is another hot, dry day. And another opportunity for the thing people in the forested Black Hills dread most: a wildfire.

The risk for fires is high in the summer of 2002. South Dakota is tinder dry from three years of drought. And for the last several days, nearly 500,000 motorcyclists have been thundering in and around the Black Hills, including Sturgis, as part of the 2002 Sturgis Motorcycle Rally.

A wildfire isn't just a distant possibility. It's a real probability.

In July, only weeks before the rally, wildfires burned thousands of acres in the "Hills" on either side of Sturgis, population 6,400. The largest fire, named Grizzly Gulch, started just outside nearby Deadwood, forcing evacuation of the town's 1,530 residents and thousands of tourists for three days. Seven homes and 15 outbuildings were lost; the rest of town narrowly escaped the same fate.

LaRue was there for both fires. Since then, he has seen countless times the charred, blackened Hills left behind—a reminder of the beauty that once was, and now is lost. He knows it is up to each of them on fire patrol to help avert another tragedy.

9:15 a.m. — *LaRue skillfully maneuvers the fire truck on a scenic, winding road that passes Rainbow Cliff en route from Sturgis to Deadwood. Scores of motorcyclists crowd the road in both directions. Despite the heavy traffic, he manages to scan the Hills, looking for wisps of smoke or other telltale signs of fire.*

As he approaches a wooded area near the roadside, he slows and turns onto a "road" of

beaten-down grass. A few hundred yards to the left is a makeshift campsite. Beyond that, another. It is a common sight during the weeklong rally when, for many bikers, the Hills literally become home. And that means LaRue has work to do.

The patrols are more than just a ride in the country. They are part of a calculated plan to keep rallygoers, tourists and the forest itself safe from fire. The mission is to spread the word that the fire danger is high and safety is paramount, as well as to quickly detect and extinguish fires.

At the helm of the patrols is a national wildfire prevention and education team, brought to the Black Hills at the request of area fire and forestry officials to plan and execute a public fire education campaign during the rally.

The effort is a necessity, officials say, given the mix of dangerous fire conditions and the large influx of people, mostly from out of state, spread throughout more than a million acres of the Black Hills.

Maury LaRue,
Sturgis Volunteer Fire
Department





Jerry Frank, from Independence, Missouri

A similar patrol effort was piloted during the 2000 rally, targeting just the northern Black Hills. It was successful, fire officials say, but limited in scope, resources and area. Lessons learned from that effort provided the basis for the more extensive operation in 2002.

9:30 a.m. — LaRue stops his fire truck short of the first camp. The “No Campfires” sign posted days earlier on a nearby tree is still there. He grabs a clipboard and some fire prevention materials and casually walks up to a group of bikers. His manner is pleasant and calm.

After an exchange of greetings, he asks if they are aware of the high fire danger and the current fire restrictions. The group says they are. They’ve seen the signs—and the burned Hills. LaRue asks if they have any questions. They don’t. He thanks them for doing their part for fire safety. It is on to the next campsite.

To establish the patrol network, prevention team members geographically divided the Black Hills, which encompass most of western South Dakota, into three fire-watch areas from north to south. They invited the 38 volunteer fire departments throughout the area to participate. Of those, 36 were able to lend equipment and personnel to the effort.

Next, the team assembled fire prevention materials — conveniently gathered in a Smokey Bear goodie bag, complete with trademark paw print — and held a kickoff meeting. There, firefighters were briefed on patrol objectives, the fire restrictions, key campaign messages and personal safety.

Ten patrol units were established to cover a daily shift from 9 a.m. to 9 p.m. for a 10-day watch period that began in advance of the rally. Those patrols augmented similar efforts

by local fire departments and the Black Hills National Forest’s 26 full-time firefighting units.

In addition, one fire department was designated in each of the three watch areas to be on duty around-the-clock to provide a quicker response to fires that did break out.

9:35 a.m. — At the next campsite, LaRue meets Jerry, “Easy” Ed and their buddies. All are from out of state. They are experienced rallygoers. They know and love the Hills. They understand the danger. And they’re more than OK with the rules.

“Coming here every year, you just know that August up here is dry and hot,” says Jerry Frank, 42, of Independence, Missouri. “You usually expect to not have a campfire. This year was drier. We’ve seen the fire damage and the signs.”

“Easy” Ed Claud, 33, is an eight-year rally veteran from Nunda, New York. He has seen fire restrictions before, adding that warning signs are “definitely a good idea,” because rallygoers from other states may not be aware of the fire conditions.

“We always ride by and check out what Smokey says,” Claud said, referring to large likenesses of Smokey Bear used by the U.S. Forest Service to show the fire-danger level. “I’ve seen it where it was so dry, you had to form a circle and smoke in a circle. I always come prepared.”

Those words are music to LaRue’s ears. The two men definitely “get it,” he says. Their attitude is typical of what he encounters as he talks to hundreds of rallygoers, many of whom readily invite him into their campsites to hear his message.

“When I go on my fire-severity patrol, the minute we pull up at a campground and grab signs, they say ‘hey man, we know. No fires,’” LaRue said. “Not one person has given us trouble. I think people misunderstand the wild, independent nature of the motorcyclists. They are just as concerned as the next citizen about the environment they live in.”

1:00 p.m. — Ray Bubb, assistant chief of the Lead Fire Department, takes over the patrol. With

the day heating up and the prime time for new fires approaching, he wants to head deep into the Hills. Bubb is targeting the remotest of areas—checking conditions, watching for fire starts and looking for a stray biker who may be camping off the beaten path, unaware of the danger and the safety precautions.

An experienced wildland firefighter, Bubb knows the Hills between Deadwood and Lead like the back of his hand. He was in the thick of it during Grizzly Gulch. He still can't believe what that fire did to his forest.

"We call this 'the asbestos forest,'" says Bubb as he looks at a stand of charred trees. "A three- to five-acre fire in the big timber is pretty normal for the northern Hills. This year, we lost some of our asbestos somewhere. To have a ten-thousand-acre fire is phenomenal."

In the southern Black Hills the story is not much different. Dry. Dangerous. Full of people. And fresh with memories of recent fires, like the 86,000-acre Jasper fire in 2000—the largest and costliest in state history.

3:30 p.m. — Assistant Chief Bill Bell, 48, and firefighter Brandon Mattson, 18, both of the Custer Volunteer Fire Department, have the day's duty in the southern Black Hills. As they cruise the Harry Mills Campground, one of many recreation spots in the Black Hills National Forest, they notice there are no fire warnings posted in the area.

So Bell pulls out his trusty tools: a wooden stake, a "No Campfires" sign, a staple gun and a hammer. He and Mattson survey the area and pick a spot for the sign between the campfire ring and the barbecue grill. This summer, the grates on all grills have been wired shut to help reinforce special fire restrictions that prohibit open flame of any kind.

Within minutes, a vanload of people pulls up. Bell greets them and begins a conversation. They are a family of six, on their way to Colorado from Illinois for their first family vacation in 16 years. They wonder if they can stop and have a picnic.

Bell assures them it's OK as long as they don't start a campfire. As they continue to visit, he weaves information on the fire danger and the current restrictions into the conversation. The family



says they have seen national news coverage of the summer's devastating wildfires. They are only too happy to do their part to prevent another fire.

Off to the side, Bell spies a shy, little girl watching him intently. He stops and retrieves his Smokey Bear goodie bag from the fire truck. As Bell hands the 7-year-old girl several Smokey Bear items — pencils, rulers, stickers — he explains the importance of being fire-safe, especially in the forest. She is clearly thrilled with the treasures. And he has touched one more person with the idea of fire prevention.

Grizzly Gulch Fire damage around White Rock, part of the "asbestos forest" near Deadwood

Sturgis Assistant Fire Chief Bill Bell hands out Smokey Bear materials





“Easy” Ed Claud, from Nunda, New York

It is the public contacts that fire officials and team members are interested in knowing about. What is learned in the field, they say, can be used to make the patrol effort better in the future.

By the end of the rally, the 10 fire patrols had made more than 6,000 public contacts, handed out thousands of pieces of fire prevention materials and had driven more than 20,000 miles. As a whole, patrol members consider the effort and the public education campaign a success.

“It didn’t matter who you talked to, what time of the day it was, or where they were,” LaRue says. “The people we met loved knowing that we were concerned about fires and about them. They told us ‘We love coming to the Black Hills and we don’t want it destroyed.’”

Bubb is a believer too.

“This is the first time in 14 years of rallies that I have not been called out during duty hours to extinguish a campfire,” he says.

9:30 p.m. — As night falls, Bubb heads back to the Sturgis fire station to complete his tour of duty. There is another truck equipment check to conduct. A field report to write. And a transition briefing to give to the firefighters who are on duty through the night.

Today, he concludes, was a good day. There were no fires. Maybe it was luck. But maybe it’s because, somewhere along the way, people have been paying attention. ■



(Left to right) Maury LaRue, Ryan Grover, his sister-in-law Kristin Grover and his brother Kenley Grover, all from Provo, Utah

A Bolder Boulder

County Races Ahead with Wildfire Mitigation

“The truism is that wherever you have wildlands... you will have wildland fire.”

— Stephen J. Pyne, *World Fire*

THE HISTORY OF THE BOULDER VALLEY in Colorado is in many ways the history of the American West.

For hundreds of years, the land of the Boulder Valley was used by American Indians to hunt and plant, and the area was a winter home for the Southern Arapahoe. Tribes of Comanche, Ute and Cheyenne also frequented the valley.

When the gold rush came to what is now Boulder County in 1858 and the first permanent, non-native settlement was established, it heralded a fundamental shift in the use of the land. Three years later, the Arapahoe and Cheyenne tribes relinquished their land rights and settlement of the region intensified.

By the time Boulder City was incorporated in 1871, the town was already taking shape, and soon the University of Colorado would open and the railroad would arrive. Subsequent years would bring still greater change, as infrastructure expanded to accommodate the influx of new residents and tourism became an increasingly important part of the local economy.

Census figures help tell the story of the city's growth: In 1920, there were 11,006 residents, in 1940 there were 12,958, and by 1950 there were 20,000. As new industries emerged and housing opportunities expanded, the population grew to 72,000 people in 1972. Today, there are more than 96,000 Boulder residents, with an additional 25,000 students at the University of Colorado. Overall, more than 291,000 people live in Boulder County.

But even in the midst of this dramatic change, townspeople showed a determination to preserve the environment around them. According to the city's official Web site, “Even before the turn of the century, it was clear to early Boulder residents that the

mountain backdrop was a special place, and the city began to acquire Mountain Parks property[.]”

That commitment remains a hallmark of Boulder's development, demonstrated more recently by the purchase of thousands of acres of open space and the adoption of a comprehensive growth management plan. In all, the city owns 60,000 acres of undeveloped land, which is larger than Mesa Verde National Park in southwestern Colorado. Boulder County has another 70,000 acres that it has preserved as open space.

Yet by retaining so much of the natural environment, residents of the Boulder Valley have created a challenge for themselves: How can they continue to live safely within the beauty of rustic settings while addressing the wildfire threat that is such an enduring part of nature?

‘Rural renaissance’

Stephen J. Pyne is a professor at Arizona State University and a leading expert on fire and its role in shaping global landscapes. In his 1995 book *World Fire*, he addressed the wildfire risks associated with what he called the new “rural renaissance”—the shifting of populations from urban to rural lands:

From the perspective of fire protection the intermix environment is often the worst of all worlds.... There is little zoning for fire control. There are few building codes to reduce hazards such as wooden roofs. There is scant pressure to reduce wildland fuels around dwellings. Open spaces that serve as buffer zones shrink as houses and woodlands expand.... Narrow roads to sheltered homesites, rustic wooden houses with shake-shingle roofs, lush vegetation dripping over walls and roofs, distances from prying officials and taxes—all this is why the exurban communities were created. To render them fireproof is to recreate the environments from which the residents fled in the first place.

“...the wood shingle industry sued the city of Boulder and sued me personally for defamation of the industry because I said that ‘wood burns.’”

— Larry Donner

In the years since that was written, destructive wildfires have reinforced the point and highlighted the challenges with alarming regularity. More than 7 million acres and 71,000 fires burned in the United States in 2002, affecting homes and communities to an unprecedented degree.

But during this same period something else has also been happening — legions of creative, dedicated people from all walks of life have joined forces and are working to lessen wildfire risks in communities located within the wildland/urban interface.

As Pyne wrote in his 2001 book *Fire: A Brief History*: “Technical solutions are possible, and widely known. Eliminate wood-shingle roofs. Clear vegetation from around structures. Design roads for easy entry and exit.... Create, in brief, a suitable system of building codes and fire practices to keep the landscape from erupting into deadly flame. The problem, however, is not one of technology or knowledge — the means to cure the disease are at hand — but of values.”

And perhaps nowhere has that been more clearly demonstrated than in the Boulder Valley, where technical know-how and shared purpose are coming together in an effort to

create an environment in which people and fire can more peacefully coexist.

Window of opportunity

Fittingly, the impetus for change in the Boulder area was fire. In Boulder County, the Left Hand Fire in 1988, the Black Tiger Fire in 1989 and the Old Stage Road Fire in 1990 together claimed dozens of homes and thousands of acres.

At around the same time, firestorms were striking other populated regions in the West, particularly in California, where the Oakland Hills erupted in flames in 1991 and stretches of Malibu, Altadena and Laguna Beach burned in 1993.

This spate of fires heightened public awareness and opened a window of opportunity for the Boulder fire community. In the years since, remarkable progress has been achieved, underlined by a multi-jurisdictional approach that emphasizes coordination, education and partnership.

As important as what was done, though, is how it was done. Behind each accomplishment is a story in which people have worked together — often in the face of opposition and sometimes with little initial hope of success — to take a positive step toward improving fire management in the wildland/urban interface.

During the 1990s, the Boulder area saw three initiatives with far-reaching effects come to pass:

- ✓ a campaign to phase out wood roof coverings in the city;
- ✓ a push to design a new subdivision with wildfire safety at the forefront; and
- ✓ a plan to identify and mitigate fire risks in the county.

A detailed look at each of these efforts shows how people throughout Boulder are making a difference.

Full court press

When Boulder Fire Chief Larry Donner first proposed in 1993 that the

The Black Tiger Fire, 1989



city's building code be amended to prohibit wood roof coverings—including shakes and shingles—he knew it would be a long, difficult process.

The local building and planning board, which is responsible for enforcing the code, would have to sign off on the proposed ordinance. The elected city council would have to approve it. Arguments from the wood roofing industry would have to be anticipated and addressed. And perhaps most importantly, residents would have to be persuaded that the change was a necessary and prudent step.

One thing happened, however, that Donner didn't anticipate—he was sued.

"Shortly after the city council passed the ordinance, the wood shingle industry sued the City of Boulder and sued me personally," he recalled. "They sued me for defamation of the industry because I said that 'wood burns.'"

But as the trial would ultimately demonstrate, the Boulder Fire Department had done its homework before proposing the ordinance.

The process actually began a couple of years earlier, when in the course of updating the city's codes the department tried to locate a wood shingle on the market that maintained its flame-resistance rating after actual weather testing. At the time, the department couldn't find any shingles that passed the Uniform Building Code (UBC) weather tests and qualified for re-certification beyond the initial three-year period.

"So we made the decision to ban wood shingles entirely—treated or untreated," Donner said. Even though parts of Boulder are not immediately adjacent to the wildland/urban interface, it was also decided that the roof ordinance should apply citywide.

"Western Boulder is next to some wildlands," Donner said. "We have prevailing westerly winds, so any fires that would start to our west would quickly be blowing toward the city given our normal weather patterns. We knew that if we had significant spotting and started some roofs on fire that we were at high risk for urban conflagration

just due to the high numbers of wood shingles we had."

Donner and his colleagues brought the proposal to the building and planning department, which reacted favorably, and together they took the next steps. According to Boulder Deputy Fire Chief Steve Stolz, who was head of the department's division of prevention in 1993, "We started our planning by looking at what we would put out in front of the community, our rationale for the change. We also knew the wood roof industry would not go quietly and let us do this."

At the many community forums, administrative hearings and council sessions that followed, the fire department made its case, and there was surprisingly little reaction from residents. While a handful of community members voiced some opposition, most showed little interest, even though the initial proposal would have required that all homes in the city change to non-wood roofing within 10 years.

"The public was generally very good," Donner said. "If you have a meeting and explain the problem, the public will understand. Even though we hadn't had any catastrophic fires, most people here were familiar with the problem."

As expected, though, the wood shake and shingle industry did take notice, and representatives soon arrived in Boulder. While Boulder was the first community in Colorado to pursue a ban on wood roof coverings, it was not the first jurisdiction in the country to do so. In fact, Los Angeles was going through a similar process at about the same time. Donner thinks he knows why Boulder drew so much attention.

"Other communities have banned untreated wood shingles, but what alarmed the wood shingle industry is that we went after the treated shingles as well," he said. "They didn't want us to take any action because they thought other communities might copy us."

The proposed ordinance was eventually approved by the city council, with one key modification. Rather than a 10-year phase in, the council elected to provide a 20-year window



Boulder Fire Chief Larry Donner



The Dakota Ridge subdivision

during which existing wood roof coverings could be replaced. The ordinance also prohibited wood roof coverings on new homes and mandated replacement of wood roof coverings when repairs exceeded 50 percent of the roof total.

“We intentionally took the strategy of phasing it out because we didn’t want to take people who were established in the community and cost them money unnecessarily,” Donner said. “I think that was key in selling the code provisions to the city council. We know that roofs wear out. It took the community a while to build itself into the situation, so we can take a little time to build ourselves out of the situation.”

After the ordinance passed, a lawsuit was filed in federal court by a group representing wood shake and shingle roofing interests. In a December 1994 ruling, while agreeing with the wood roofing industry that the Boulder ordinance was too vague because it did not define wood, the judge said that the city had in fact acted on a rational basis.

The judge also dismissed Donner — who had been on the witness stand for six hours during the trial — as an individual defendant in the lawsuit. Soon after the court’s decision, the ordinance was rewritten to define wood and it went into effect in 1995. While Boulder lost the battle it won the war, and for Donner the fight was worth it.

“We’re now seven years into it and we’ve had a turnover of approximately 30 to 40 percent of the roofs in Boulder,” he said. “It helps

reduce our concern for urban conflagration. We still have an interface problem, but at least it won’t be compounded by acres of wood shingles downwind from the interface.”

Deputy Chief Stolz drew a number of lessons from the experience. “The process can be painful at times. It requires research and analysis. The building officials are a critical component, and it takes lots of cooperation with them. The timing has to be right. In any jurisdiction, there are windows of opportunity. You have to be patient and persistent. Education is a huge component. You need the support of the community and the political establishment.”

And if all that doesn’t work? “Take another run at it,” he said.

The high road

On the north side of Boulder, the Dakota Ridge subdivision sits nestled against grasslands and rolling foothills, on the edge of a greenbelt that encircles the city.

The first phase of construction began in November 2000 and features design principles of “new urbanism,” which promotes interaction among residents by combining homes with places for people to work and socialize. Eventually, Dakota Ridge will contain 400-plus residential units, including single-family homes, town-houses and condominiums. It will also have commercial and civic sites, and a park.

At first glance, the Dakota Ridge subdivision looks like any other. New houses sit on gently winding streets and young trees line the sidewalks, against a backdrop of open skies. Nearby, construction workers continue adding to the development.

But in fact, a road that runs around the exterior of the development makes this subdivision quite different.

From a firefighting perspective, many subdivisions near wildlands share similar drawbacks in their design that make the job of protecting the homes from wildfire difficult. Marc Mullenix, the wildland fire

division chief for the city of Boulder, has seen the problem in subdivisions throughout the United States, particularly in the West.

“What typically happens in the interface is that you end up with homes directly up against the open space,” he explained. “The difficulty is that the water is on the inside where the road is and the homes are on the outside. So to protect these homes you have to park an engine in the subdivision, hook up to the hydrant and wrap the hoses around the outside of the houses.

“Then you have to go and put firefighters in harm’s way.”

The process that led to the construction of Dakota Ridge actually began in the early 1990s, when local developer Rich McCabe moved to build on the 57-acre site, which at

the time was one of the last major pieces of undeveloped land in the city. From the beginning, the project received significant attention.

“It is a unique subdivision,” said Brent Bean, a senior planner with the Boulder Planning Department. “It is on the fringe of the city and it is right at the step of the foothills in open space areas.”

Bean, whose father was the first planning director for Boulder, said that once the project was introduced the city’s planning and fire departments worked closely with McCabe and his team. As it turned out, there was common ground that served the interests of everyone, and it involved a bold proposal — place a road around the exterior of the subdivision, with hydrants, to act as a buffer between the housing and the open space.

This view of construction at the Dakota Ridge subdivision clearly shows the road that forms a fire barrier from the wildland



“To talk about hazards to homeowners, we realized that we needed to have a better understanding of them ourselves.”

— Nan Johnson

As the process moved forward over an eight-year period, there were numerous meetings among the various parties involved — including, at times, the developer, the builder, the design consultant, city planners and firefighters, and local residents. When a plan for the new community finally came together, the exterior road was a prominent feature of the design.

For firefighters like Mullenix, the benefits were clear. “The road on the outside up against the open space acts as a fuel modification, and then we have the water out there also,” he said. “That gives firefighters a place where they can work efficiently and safely.”

Justin Dombrowski, the wildland fire management officer for the city of Boulder, explained why the direct access offered by an exterior road is so important, especially in a large fire where resources are limited.

“To protect a typical subdivision, we’d have to put one engine at every single house, plus extra mobile engines,” he said. “We staff eight engines, and that’s for an entire city of 100,000 people. Even working with our volunteer fire departments, we don’t have enough resources to do that. With a design like this, we can have a couple engines float around the outside and protect the entire subdivision.”

From McCabe’s perspective it was a win-win, even though it meant increased development costs. “The perimeter road works with the principles and goals of new urbanism,” he said. “Having the street on the perimeter next to the prairie lands allows the public to enjoy it, walking or driving down the street. They have a clear view of all that wonderful open space. And it turns out the wildfire element fits quite well with that design concept.”

According to Nan Johnson, who at the time was with the Boulder County Land Use Department and later moved on to a similar position with the city of Boulder, the outcome demonstrates not only the importance of private-public partnerships, but partnerships within government.

“If the fire department hadn’t said anything about it, the planning department probably wouldn’t have picked up on it,” she said. “Wildfire design is just not something that planners have a background in. It was a unique thing and it was a good collaboration.”

In addition to the exterior road, the subdivision will include other fire-safe elements. For example, a manicured, three-acre park will be strategically located, and the landscaping will avoid flammable and combustible vegetation like pine trees.

McCabe, who moved to Boulder in 1961 and has worked as a developer there since 1965, said he has heard “nothing but good things” about the subdivision’s design. McCabe also noted that approximately 10 acres on the original site were given to the city to be preserved as open space.

When the exterior road was first proposed, the 1990 Old Stage Road Fire was fresh in everyone’s mind. That fire, which destroyed 10 homes and covered 2200 acres, burned land that would one day be home to Dakota Ridge. More than 10 years later, in July 2002, the Wonderland Lake Fire struck near the same area — and a wide trail designed for fire trucks to drive on behind the subdivision was widely credited with aiding firefighters’ response.

The road that circles Dakota Ridge has had at least one other important benefit. According to McCabe, it works as an effective buffer against encroaching prairie dogs.

AWHIMSical idea

The Black Tiger Fire began in the Rocky Mountains near Boulder in July 1989 and quickly swept through nearby residential areas. After a four-day rampage, the blaze had claimed 44 homes and structures and burned more than 2,000 acres. At the time, it was the worst fire loss in Colorado history.

In the months after the fire, the Boulder Board of County Commissioners began to look for ways to help minimize the loss of life and property from future wildfires. Out

of this effort, the Boulder County Wildfire Mitigation Group was born.

As the group met, it became apparent that helping responders pre-plan and educating the public about risks would be top priorities. But according to Nan Johnson — who joined the county planning staff in 1991 and started attending sessions of the wildfire mitigation group soon thereafter — something else grew equally apparent.

“To talk about hazards to homeowners, we realized that we needed to have a better understanding of them ourselves,” she said. “We needed to know what the hazards were, where they were and what it would take to mitigate them.”

Johnson came to the group with a background in Geographic Information Systems (GIS), and she and others thought that the county’s already-existing GIS system could be an effective way to pull all the pieces together and show fire protection issues in a dynamic way. As the discussions grew increasingly more technical, it was decided that a separate working group would form to examine the issue.

That was the beginning of what is now called the Wildfire Hazard Identification and Mitigation System, or WHIMS, and the beginning of a years-long crusade for Johnson and her colleagues.

Although the county already had access to some helpful material, such as lot boundaries, ownership records and other parcel data from the assessor’s office and topographic figures from the U.S. Geological Survey, the specific fuel-type and homeowner assessment information needed to plug into GIS for a complete picture did not exist.

So the WHIMS team elected to go out and get it, developing a questionnaire and planning one-on-one, on-site interviews with area landowners. “We decided we were going to take a project area and start with one local fire district,” Johnson said. “We also put a lot of time into figuring out what questions to ask.”



At the same time, the Colorado State Forest Service undertook a survey of its own to generate critical data about area fuel types.

Johnson said that defining what makes a hazard was a learning process for everyone. A turning point came when the group shifted from its initial assumption that water and access were the chief culprits.

“We learned through our firefighters that they aren’t, because in this county we don’t have water and we don’t have access,” she said. “So the emphasis in the surveys became building location, construction, landscaping and defensible space.”

One other key question remained: Who should conduct the surveys? A lengthy debate followed, and it was finally decided that — despite the size of the job — volunteer firefighters should handle the assignment.

“They are the ones that need to respond to these events,” Johnson said. “They are the ones that need to know the property. That is their constituency. The homeowners need to get the correct answers and need to be asking their volunteer firefighters these questions.”

Getting the 20 fire protection districts in Boulder County on board involved a series of discussions in which the WHIMS team had to demonstrate the tangible benefits of the project. There were also concerns about how planning departments and insurance companies might use the information gathered.

Marc Mullenix (foreground) and Justin Dombrowski, Boulder Fire Department

“Those concerns still exist, and that’s the reason why some districts haven’t participated,” Johnson said. “It is a matter of trust and of seeing benefits. We made a commitment to homeowners and told them what the information is for — for educating and motivating.”

WHIMS information packets were mailed out beforehand so residents would not be surprised by a visit from a survey team. The information packets were assembled by local inmates.

Today, some 10 years after the process started, more than 6,000 homes have been evaluated. While the county maintains the central database, the information is shared with the local fire districts, and they are putting it to good use.

Mike Tombolato, who as Boulder County’s first wildfire mitigation coordinator was heavily involved in the development of WHIMS, is now chief of the Cherryvale Fire Protection District. According to Tombolato, WHIMS has grown into a true multi-purpose tool.

“We use it for pre-planning and hazard assessments,” he said. “We provide the

assessment data to homeowners for education, to engine companies for response, and to mutual aid for addresses and roads.”

Every summer, Cherryvale has a wildland crew performing mitigation, and once the fire season slows that same crew updates the WHIMS assessments to keep information as current as possible. In terms of homeowner education, Tombolato said WHIMS offers immediate benefits.

“We’ve started making our assessments on Palm Pilots,” he explained. “Now we can make the assessment, plug into a laptop and printer, and give the assessment to the homeowner in real time. We can show them how to make their hazard rating come down. For example, we can show that if you move the propane tank, here is how the assessment would change, and why.”

The city of Boulder has its own version of WHIMS, called FIRMIT (for fire mitigation), and it, too, has become an important education tool.

“We originally thought the surveys would take ten minutes,” said Dombrowski, the Boulder wildland fire management officer. “But they averaged thirty to forty-five minutes because of the one-on-one education. We know that the best education is face-to-face at the person’s house, by the local firefighter who is going to be the one responding to the house if needed.”

The county maintains wildfire hazard maps online at its Web site, as well as a WHIMS manual at www.co.boulder.co.us/lu/wildfire. For Johnson, it is important that mitigation always be talked about in tandem with identification.

“The mapping and hazard rating is just a tool, it is part of a bigger program,” she said. “WHIMS is not just about mapping, but finding out what the hazards are, getting them into a medium for educating and training and planning, and then getting programs implemented based on that.”

To that end, Johnson hopes to see expanded uses of WHIMS and FIRMIT data to

Nan Johnson, city of Boulder



“We know that the best education is face-to-face at the person’s house, by the local firefighter who is going to be the one responding to the house if needed.”

— Justin Dombrowski

include code and policy changes as well as more involvement with planning. “Hopefully, it won’t take another big fire to do it,” she said.

A question of when

While much has been accomplished throughout Boulder County, significant work remains. The challenge ahead continues to occupy the efforts and thoughts of firefighting professionals and their partners in the government and the community.

New residents arrive in Boulder every day, many from places where wildfire is not a

threat and for whom the earlier fires are not a memory. And as with many jurisdictions nationwide, mitigation must often compete for funding and support among other critical needs. It is a balancing act that requires equal parts dedication and creativity.

For communities in the wildland/urban interface, questions about wildfire have to be prefaced by when and where, not if. In the Boulder Valley, that fundamental truth is firmly rooted in the fires that continue to burn across its lands, and in the efforts of residents to pull together and live safely there anyway. ■

Successful Boulder-Area Wildfire Mitigation Initiatives

- ✓ Formation of the Boulder County Wildfire Mitigation Group, which brings government and community leaders together with firefighting professionals and area residents to address issues of shared concern.
- ✓ Creation by the city of Boulder of a full-time wildland fire coordinator position to help manage wildland fire issues on city properties and to work with adjacent fire departments.
- ✓ Formation of the Boulder County Wildland Fire Cooperators to address training and coordination among area fire agencies and cooperators.
- ✓ Initiation by the city of Boulder of a comprehensive prescribed burn program in the wildland/urban interface.
- ✓ Development of a GIS-based risk assessment tool for Boulder County, known as the Wildfire Hazard Identification and Mitigation System (WHIMS).
- ✓ Passage by the city of Boulder of an ordinance phasing out all wood roof coverings.
- ✓ Creation by Boulder County of a full-time wildfire mitigation coordinator position to help deal with wildland fire threats in wildland/urban interface areas of the county.
- ✓ Implementation of a Boulder County site plan review ordinance requiring a wildfire mitigation plan for any new house as a condition of occupancy.
- ✓ Establishment of the Boulder County Ecosystem Cooperative, designed to identify and promote innovative ecosystem restoration opportunities on public and private lands.
- ✓ Passage of a public safety tax in the city of Boulder that funds mitigation and education efforts, including a seasonal Wildfire Response Group that reduces fire fuels on city open spaces.
- ✓ Development of a task force composed of the various county wildland firefighting jurisdictions that can deploy within the county or to nearby counties as a quick-attack hand crew or fire suppression team.
- ✓ Creation of a wildfire evacuation plan for the city of Boulder and neighboring communities, with permanent signs posted on evacuation routes.
- ✓ Establishment of a helicopter firefighting program that makes a helicopter and crew available for the Boulder area and beyond during fire season. ■

A Community Unites

Glenwood Springs manages post-fire flood risks

AS SNOW FELL IN LATE OCTOBER 2002 on this quaint mountain resort community on the Colorado River, more than 250 residents along the Mitchell Creek corridor breathed a collective sigh of relief. For the first time in months, the moisture falling on slopes denuded by the Coal Seam Fire did not pose a major flooding risk.

“It’s been a long year,” said Lee Bowles, mother of two and a resident of the high-risk Mitchell Creek area on the west side of Glenwood Springs. “Since the fire you constantly watch the skies, and rush home every time it looks a little dark. Living under the constant threat, it wears on you.”

Residents were evacuated a half dozen times during the summer of 2002. Some of the evacuations turned out to be false alarms, but other storms filled streams, gullies and roads with chocolate-brown debris. On two occasions, floodwaters inundated basements, blocked roads and damaged vehicles.

The Coal Seam Fire started on June 8, 2002, when a coal seam burning underground for nearly a century ignited vegetation in South Canyon just west of town. Fanned by

intense winds and record drought conditions, the volatile blaze jumped the Colorado River and Interstate 70, threatened thousands of homes and businesses, damaged or destroyed more than 30 structures, and scorched more than 12,000 acres of public and private land.

But before the fire was even put out and damage statistics tallied, Glenwood Springs residents were preparing for a post-fire aftermath of flooding and the related ash, debris and mudflows.

“It became real apparent that this fire was a repeat episode of Storm King,” said Garfield County Sheriff Tom Dalessandri, referring to the deadly July 1994 blaze and the 10-foot mudflows that closed Interstate 70 shortly thereafter. “We knew that we’d experience at least some effects of mud and water, so just a few days into the fire we started planning.”

The mud/flood team

“We don’t rely on any one system.”

— Andrea Holland-Sears, BAER team hydrologist

Local residents and government officials put a disaster task force together to help mitigate flood risks to 120 residential properties in areas left most vulnerable after the Coal Seam Fire. The structures in harm’s way were an eclectic combination of properties that included a mobile home park, a fish hatchery, a ranch and million-dollar houses that snaked alongside Mitchell Creek on the west side of town.

The Mud/Flood Task Force met weekly throughout the summer to discuss issues, share resources and ensure that response and recovery efforts were well coordinated. During a roundtable discussion in late September 2002, several members of the group gave invaluable advice to communities that might one day face similar post-fire flood threats.

Dalessandri said that a Burned Area Emergency Rehabilitation (BAER) team provided crucial information regarding post-fire effects and how to keep homes and lives safe from flooding. Brought in by the U.S. Forest

Residents of West Glenwood evacuate beneath an afternoon sun dimmed by smoke from the advancing Coal Seam Fire



Service and the Bureau of Land Management, the BAER team was composed of highly skilled soil scientists, geologists, ecologists, engineers, foresters, botanists and other specialists trained to assess damage caused by fire.

The team suggested numerous post-fire emergency management and mitigation strategies for Glenwood Springs, including additional weather monitoring equipment, resident weather-spotters, localized treatment of denuded slopes, apparatus to channel anticipated mudflows away from improved property, advance-warning systems, evacuation procedures and meeting points that would allow local emergency managers to account for area residents.

The early-warning system that was installed on the mountainsides above Mitchell Creek was comprised of three computerized sensors to measure rainfall. The sensors were programmed to alert authorities if they reported rain quantities capable of producing a “land movement event.”

Members of the BAER team also recommended that the Mud/Flood Task Force not rely completely on the early warning system.

Andrea Holland-Sears, a hydrologist for the BAER team and a member of the task force, said, “The early warning system is a tool, not the only one in place. We don’t rely on any one system. We have other resources, such as the community, to depend on.”

Those community resources included people from a variety of backgrounds who worked with officials on evacuation plans for the community. The task force was made up of emergency response personnel, information officers, natural resource specialists, non-profit organizations, government administrators, dispatchers and private citizens.

Egos checked at the door

“That sense of community has to be there before people can be willing to come together.”

— *Bill Kight, U.S. Forest Service*

The first meeting of the Mud/Flood Task Force was facilitated to encourage the com-



Remains of a house in West Glenwood

munication that would be critical to the group’s success.

“I can’t emphasize how important it was for all departments to knock down the barriers and start communicating freely,” Holland-Sears said. “We couldn’t have set up that early warning system as successfully as we had without understanding how the law enforcement radio system operated.

“As a hydrologist, I normally don’t even know how radios work, but working with the Glenwood Springs police, we were able to solve a lot of problems that we wouldn’t even had found out until after the first event.”

Bill Kight of the U.S. Forest Service said that community members pitched in above and beyond the call of duty.

“That sense of community has to be there before people can be willing to come together and lay down their territorial problems and their egos and say, ‘We need to address this situation,’” he said.

Kight cited the placement of jersey barriers along Mitchell Creek as an example of cooperation among multiple jurisdictions. “Putting in the jersey barriers happened really fast,” he said. “I think the BAER team was even surprised at how quickly some of the things happened.

The Natural Resources Conservation Service (NRCS) emerged as a key task force partner, implementing communitywide flood mitigation strategies. Since NRCS has more latitude than most federal agencies to perform



A burned house along Mitchell Creek

work on private land, it made sense for the group to coordinate those efforts.

Going door-to-door, Dennis Davidson from NRCS gathered the approvals that were necessary before the work of lowering the flood potential throughout the Mitchell Creek corridor could begin.

Together with the Colorado Department of Transportation and the county road and bridge department, NRCS cleaned debris from streambeds to prevent culvert blockages, placed hundreds of concrete jersey barriers to channel anticipated debris flows and helped with sandbags around the homes at greatest risk.

“Our first real work was to get the jersey barriers into place,” Davidson said. “We put in 625 barriers stretching 6,000 feet along the creek and other vulnerable areas.” Mitigation efforts also included the removal of debris from Mitchell Creek itself, filling a total of 54 dump trucks.

“Under the water protection program, we were able to secure emergency funding from the Bureau of Land Management and begin work that was considered ‘urgent and compelling’ within a few hours of the fire,” Davidson explained. The county also released \$100,000 in emergency funding within the first week of the fires to address flooding risks.

“We had three storms in August that produced debris, filling up driveways,” Davidson added. “I’m certain homes would have flooded without these barriers.”

Managing expectations

“We can’t guarantee your safety. You have to guarantee your own safety.”

— *Garfield County Sheriff Tom Dalessandri*

According to Dalessandri, one of the major challenges was setting a tone for the recovery that gave residents realistic expectations for the risks they faced without being alarmist. Though residents grew weary of the evacuation alerts, Dalessandri and his staff felt a responsibility to warn people of potential hazards.

“We proved that the best information is real information,” Dalessandri said. “We were very careful what we told people, but we didn’t withhold information. We were very sensitive to their needs, but at the same time we were very frank about everything. We didn’t sugarcoat our answers. We made it clear to people what was available and what was not.

“That honesty paid off in the long run,” Dalessandri added. “Though people may be frustrated or tired from this long ordeal, they’re still believing that there’s credibility in what we have to say.”

The goal was to avoid unrealistic expectations by letting residents know the extent to which government could help them, and the ways in which residents could help themselves by taking responsibility for their own welfare.

“Communication is the key, I think, that made it possible for all of us to work together better and keep that level of trust,” Kight said. “You don’t make promises you can’t keep.”

But finding ways to reach the 8,000 residents in Glenwood Springs with accurate and timely information remained an issue. One of the solutions involved using a resource center to field questions from the community, which Dalessandri knew had been effective in the aftermath of the 9-11 terrorist attacks.

“When the Coal Seam Fire erupted, we moved our resource center from the county building and relocated it to the high school because there was need for ample parking,” he said. “We filtered news to the center and

“I didn’t even know I had a gully behind my home until after the fire. The brush was so thick you couldn’t see it.”

— Victor Gabossi

we disciplined ourselves to make sure the information got to the public affairs people.”

Dalessandri and his colleagues also attended numerous community meetings and led residents on tours of neighborhoods damaged by fire or flood. Information regarding evacuation procedures and disaster mitigation measures was made available in both English and Spanish.

The task force even got into the publishing business, starting its own bilingual newspaper, *The Mud/Flood Gazette*, which was distributed throughout town.

Ron Vanmeter, public information officer for the Garfield County Sheriff’s Office, said that the experience taught him a simple truth. “We’ve learned that people’s need for updated and current information is crucial,” he said. “Once the public is given just the facts, then it’s a matter of time and trust.”

Teamwork pays off

“This is how government is supposed to work.”

— Victor Gabossi, Glenwood Springs homeowner

Victor Gabossi is fairly confident that his house will survive the next firestorm. In addition to the fuel loads taken out on the hillside during the Coal Seam Fire, Gabossi replaced his wooden roof with asphalt shingles. He even built a rock wall and a wide concrete driveway to serve as firebreak between the hill and his home.

By late September 2002, the Glenwood Springs resident was more worried about losing his home to a mudslide.

“I think we’re going to have some major storms before the vegetation grows back,” he said, as he looked up at a group of volunteers reseeding the hill behind his home. More than 70 volunteers from all over Colorado assisted in the restoration project to help prevent future mudflows.

Gabossi pointed up the barren hillside to an earthen berm behind his home.

“I didn’t even know I had a gully behind my home until after the fire,” he said. “The brush was so thick you couldn’t see it. After a foot of mud covered my front yard, I talked to Dennis Davidson from NRCS and he



Jersey barriers protect a farm near Mitchell Creek

came out and made sure that berm was high enough to divert the water away from my home.

“I think among the local officials, the county commissioners and NRCS, it’s been great teamwork, Gabossi added. “This is how government is supposed to work.”

Dalessandri attributed the generally harmonious interagency cooperation to two factors: no single agency had sufficient resources to manage the problem on its own, and local, state and federal agencies each had a unique role to play in the recovery.

Even funding responsibilities were shared. Although the total cost of the mitigation efforts reached \$5 million, Dalessandri said help from state and federal agencies allowed the county to absorb costs within its regular budget.

Emergency managers freely acknowledged one other critical part of their success — luck. Glenwood Springs was spared the monsoon downpours that hit Durango in southern Colorado and caused massive mudflows.

“Each rainstorm we had moved debris in increments, rather than all at once,” Holland-Sears said. “I have to keep reminding folks that slope stabilization efforts are effective only to a point. Very large rain events can overwhelm even the best designed mitigation measure.”

In Durango, where the Missionary Ridge Fire consumed more than 70,000 acres in June 2002, dozens of homes and businesses were damaged when August monsoon rains brought major mudflows — despite strategic efforts to protect properties from flooding.

The terrain was too steep and the rains were heavier than those in Glenwood Springs, according to NRCS District Conservationist Dan Lynn. “We had to encourage one Durango family to leave their newly built home,” he said. “There was just no way we could protect them.”

A roadmap for action

“Based on our mitigation strategies, we definitely saved homes and we may have saved lives.”

—*Sheriff Dalessandri*

The concrete barriers remained in place along Mitchell Creek well into 2003, a reminder to nearby residents that post-fire threats would likely be long lasting. Dalessandri, for one, was already looking ahead and planning his community’s response to future disaster events.

Thanks to his experiences in the summer of 2002, he had developed a roadmap for action: establish pre-designated command posts and staging areas; pre-deploy basic equipment such as laptop computers, radios and cell phones; share emergency contact information; set-up procedures for accessing supplies, such as water or ice; and develop strategies for demobilizing as the incident subsides.

According to Dalessandri, all these things may be easily overlooked during day-to-day operations but are vital during an emergency. And perhaps the most crucial element to an effective disaster operation, he said, is ensuring that everyone is on the same page “with the same mission in mind, the same agenda and the same priorities to help victims.”

Dalessandri felt certain that the coordinated efforts among emergency responders did make a meaningful difference to the Glenwood Springs community and its residents.

“Based on our mitigation strategies, we definitely saved homes and we may have saved lives,” he said. “How many? It’s hard to say. But the work is in place so we can ensure that we have given our best effort to prevent any significant loss — be it person or property. With that perspective, we can declare it a success.

“This project has been a classic example of how federal, state and local government can work well together.” ■

Add Flood Insurance to Wildfire Safety Checklist

More about
floods following fires

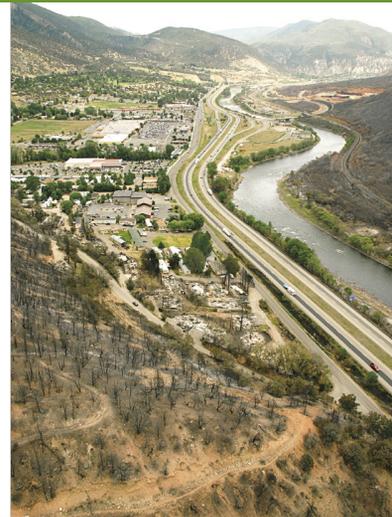
IF YOU LIVE IN AN AREA where fires have burned the hillsides, even a relatively small amount of rain can cause erosion and potentially devastating floods. Homeowners, business owners and renters can protect themselves by purchasing federally backed flood insurance, as long as their community participates in the National Flood Insurance program (NFIP).

There is a 30-day waiting period after purchase before the policy becomes effective, so it pays to plan ahead.

For a single-family home, flood insurance coverage is available up to \$250,000 on

a structure and up to \$100,000 on contents. Renters can also insure contents up to \$100,000. Business owners can purchase coverage up to \$500,000 on a structure and another \$500,000 on contents.

To buy flood insurance, call your insurance agent. If your agent does not write flood insurance policies, you can find an agent who does by calling the NFIP's toll-free number at 1-888-FLOOD29 or TTY 1-800-427-5593. You can also check your local phone directory or visit the FEMA Web site at www.fema.gov/nfip. ■

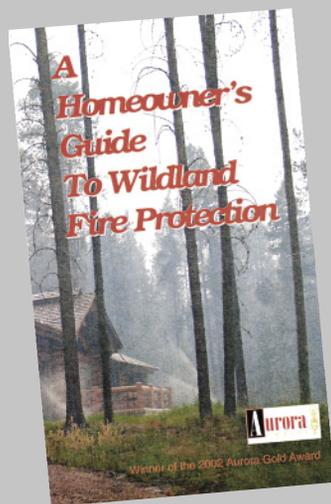


▲ View of West Glenwood with Colorado River, Interstate 70 and burned hillside at left



Burned house beside Mitchell Creek

Evacuees Star in Local Film Remake



NOTHING MAKES A VIDEO ABOUT WILDFIRE PROTECTION more popular than a wildfire in your own backyard.

It makes for good footage, too.

Those were some of the lessons learned when the Jackson/Teton County Fire Department in Wyoming remade its own educational video in 2001–2002, *A Homeowner's Guide to Wildland Fire Protection*.

But those lessons were not the only ones learned.

Bringing it all back home

The Jackson Hole region in western Wyoming is surrounded by some of the largest areas of undisturbed forests and wilderness in the lower 48 states. Mixed in among that sprawling wilderness are approximately 1,500 homes, ranging in value from \$150,000 to \$10 million, as well as some large commercial tracts.

"We've had a wildland/urban interface problem here for about a million years," says Rusty Palmer, fire marshal and deputy county fire warden.

Concern about the problem prompted the fire department to make a wildfire mitigation video in the early 1990s. Palmer likes using video to get across the mitigation message.

"There are a lot of ways to get your message out that are less expensive," he says. "There aren't a lot of ways to get your message out there that are better. It's visual. It's auditory. It's redundant. People can play it over and over. It really hits home with folks."

However, by 2000 there were problems with the 30-minute video made almost 10 years earlier. It opened with footage of a large Minnesota fire, and included about 18 minutes of footage produced by the National Fire Protection Association in the early 1980s, sandwiched between segments shot in a studio with local residents. The transitions were not smooth and the people and techniques looked outdated.

"The message was OK, but it had things about cheatgrass in Nevada. It was hard for local folks to latch on to," Palmer says. The

department decided to make another, more up-to-date and localized video about wildfire mitigation for homeowners.

The first step in making a new and up-to-date video was to make a new and up-to-date budget. The first video cost only \$3,500. The new one was budgeted (and completed) for \$25,000. Of that amount, \$15,000 came from local sources.

The fire department began accumulating funds for the project over several years in a wildland fire account. "We knew we were going to make it, so we started budgeting a long time ago," Palmer says. "It was a normal evolution for us."

Additional local funds came from Teton County and the town of Jackson, and as in-kind donations from the Jackson Hole Chamber of Commerce, Movie Works Theatres and the fire department. A \$10,000 grant from the Western States Wildland/Urban Interface Grant Program provided the balance.

The second step was the decision to take a "down-home" approach to the new video. By emphasizing local people and places, viewers in the area would see faces they knew and settings they lived in, to bring home the message that they needed to take action in their own backyards. While celebrities are numerous in the area, the department decided not to use any in the video.

The third step was the careful process of choosing a filmmaker. Candidates were required to submit a proposal and three work samples to be carefully reviewed by a panel of four department members.

Panel members included Palmer, who was involved in the making of the original video and was accustomed to viewing videos for their public education value. Another panel member was a trainer and division chief who was accustomed to viewing videos for their instructional value. The other two panel members did not have specifically video-related backgrounds.

"I was glad that we got them to submit at least three pieces of work," Palmer says. "It

gave us a general sense of what they would be able to accomplish.”

The panel decided to make the video 30 minutes long. Shooting would start in 2001 and the video would be delivered early in 2002. Cost was a concern, but was not pre-eminent.

Perhaps most important, the panel reacted to the quality of the finished product in the sample films they reviewed. In addition to technical quality, panel members were concerned about “whether or not the film touched them, made sense,” Palmer says. “We wanted to make sure the overriding message was understood.”

The department received bids from three filmmakers, and settled on SavaFilm, a local production company whose samples demonstrated what Palmer calls a “good sense of content.” Sava Malachowski, the chief cameraman for SavaFilm, had already proceeded to get a firefighting red card after submitting the bid. The card would allow him access to shoot on the fire lines at wildfires or controlled burns if any occurred in the area.

Palmer says that other than Malachowski and the video crew, the project initially met with more apathy than resistance from the community.

That soon changed.

Fire was the unexpected star

The company was about one-third of the way into production when the Green Knoll Fire broke out just five miles from Jackson on July 22, 2001. The fire proceeded to burn for days, threatening hundreds of homes and causing nearly 200 evacuations as it consumed 4,470 acres.

“With the Green Knoll, we completely changed what we were doing,” Palmer says. “The whole emphasis of the film changed.”

One change was the focus on a large local fire that provided an inarguable demonstration of wildfire risk. “Fortunately, the filmmaker was red carded so he was able to get a lot of

dramatic footage,” Palmer points out. “That was a value-added benefit.”

In addition, the occurrence of an actual fire enabled the filmmakers to incorporate stirring interviews with local people who had been evacuated because their homes were surrounded by fire, and who could testify what it felt like to face the prospect of losing their homes to wildfire. “That was a piece we hadn’t even thought about until we started talking to them and hearing their stories,” Palmer says.

The fire also changed the attitude of local people toward the video project itself. Palmer recalls, “The minute Jackson Hole was on fire, they were asking, ‘When’s the film going to be done?’”

Ironically, the fire department’s initial project proposal itself had stated, “Clearly one of the strongest attitudes to overcome in prevention activities is an ‘it won’t happen to me’ attitude. Few people building within the interface think about the potential for wildfire before they build. Many think about it only after a local catastrophe or near miss. The impact of people seeing the aftermath of interface fires does have an effect.”

Point made.



Jackson/Teton County
Fire Marshall Rusty
Palmer



Sava Malachowski and
Valerie Schramm of
Savafilm

▶ Bill Nash and his house were featured in Savafilm's "A Homeowner's Guide to Wildland Fire Protection"



And the envelope please . . .

Topics covered in the completed instructional documentary — formatted for VHS video — include the wildland fire problem in Teton County and the United States, basics of fire behavior, choosing a wise location for structures, home design and building materials, creating a survivable landscape and creating a space that can be defended by firefighters.

The new video includes a few clips of footage shot elsewhere in the country, but

even those clips generally appear as if they could have been shot in Wyoming.

Thirty people appear in the video — counting homeowners, wildfire experts and others — and most are from Teton County. The local people, the local settings, the footage of the searing local fire and the interviews with those who had feared losing their homes all work together to make a powerful message that fire mitigation starts here, and now.

Despite the fire-induced changes, the video came in within budget and essentially on time. Scheduled for completion in February, the video actually premiered in April. It came out right at the start of the 2002 fire season, a prime time to begin mitigation efforts.

Palmer says the most important part of the distribution plan was saturation of the local market. Reaching homeowners' associations was relatively easy, he says, because the fire department had an existing relationship with them.

"They have private water supplies we like to use, so we're in touch with them at least once a year," he explains, adding the department used an existing mailing list for sending a copy of the video to each association. In addition, he says the department presented programs to six or seven of the organizations.

Local distribution also included public venues, particularly libraries. Copies were made available for rent at local video stores, but Palmer says people did not seem interested in renting it, perhaps because they could borrow it at no cost from the library or purchase their own copies for \$5.

The fire department showed the video to businesses and presented it in schools, along with similarly targeted presentations on topics like the psychology behind teenage arson and fire safety in kitchens.

They got more than 30 follow-up calls in less than one year from people who had seen the film and wanted additional help in reducing their risks.





By the end of January 2003, the fire department had distributed 500 copies of *A Homeowner's Guide to Wildland Fire Protection*.

The video has been distributed throughout the state and is available on request to callers. It has been broadcast statewide on Wyoming Public Television and was shown twice during the 2003 National Fire Plan Conference in New Orleans, a federal/state/local conference that works on implementing the national strategy for managing wildfires. The conference was attended by 400.

In addition, *A Homeowner's Guide to Wildland Fire Protection* won an Aurora Gold Award in an international independent film and video competition for its creativity, message effectiveness and technical excellence.

Palmer says even though people are more likely to lose their homes to a structural fire, they are more fearful of wildfire — and the video provides an opportunity for firefighters to educate people about wildfire mitigation and reducing home fire danger. When members of the fire department present the video at meetings or visit a home to talk about risk reduction, they may also talk about such topics as wood stove safety and smoke detectors.

But the video is only one of an assortment of educational tools. The fire department uses personal visits, a PowerPoint presentation and literature that ranges from items to stick on a refrigerator to two handouts for homeowners — one on how to mitigate while building a

A few of the many homes deep in the forest near Jackson Hole



Valerie Schramm and
Sava Malachowski

home, the other on good maintenance for mitigation. The department also works with outside groups that help educate owners and help create defensible space.

Whenever firefighters make an educational visit to a home, Palmer says, “We go loaded with brochures. We may not have the opportunity to go back.”

Lessons learned

Along the way, Palmer discovered that filmmaking is a highly collaborative process that requires ample time for communication. “We spent a huge amount of time in discussion,” he says. “That was one of the things that caught me off-guard.”

If Palmer had it to do again, he says he would learn more about video production at the start. He had a “little epiphany” about the different views of a video held by filmmakers and firefighters. “I’m looking at it as a tool with a budget,” he explains. “They’re looking at it as a piece of art.”

He thought making a film was just about writing, shooting and editing, but he found

those elements to be just a small part of the process. Other important factors included the quality of light, excess noise in the area and the color of the background. He recalls editing sessions with Malachowski and director/writer/editor Valerie Schramm.

“We completely reorganized the film at one point,” Palmer says. “We looked at the first cut and it just didn’t seem to flow.” While he had not expected to spend so much time on the video, he is glad he did. “I’m 100 percent more educated and knowledgeable than I was before I started,” he says.

Malachowski agrees that good communication contributes greatly to the quality of the final video. “Filmmaking is a very collaborative process and the quality of a film is always a sum of inputs from everybody involved in it,” he says. “Finding time to communicate among various collaborators is very important.”

The effort put into the video is paying off in mitigation around Jackson Hole, according to Palmer. Homeowners in subdivisions threatened by the Green Knoll Fire are making changes. Those who participated in the film feel particularly compelled to take action. Residents who used to resist clearing trees because of their sentimental value, Palmer says, are now cutting trees.

He attributes much of the success of the video to the use of local people, the footage of the Green Knoll Fire, and particularly to the interviews with those whose homes had been threatened.

“I wanted local folks to hear the emotion in their voices,” he says. “It’s something we wouldn’t have had (without the fire). It anchored the credibility of the film by using those local folks who actually experienced it.”

Copies of *A Homeowner’s Guide to Wildland Fire Protection* are available in VHS format for \$8.20 each, which includes shipping, through the Jackson/Teton County Fire Department; P. O. Box 901; Jackson, WY 83001; (307) 733-4732. ■

Counties Give Wildfire a Run for Its Money

IN THE GREATER HELENA, MONTANA AREA, wildfire survivability is a hot topic.

With awareness of the problem growing, so too are solutions—including efforts to stem the effects of wildfires on the private and public lands that expand beyond Montana’s capital city.

Roadsides, hillsides and open-space areas are being treated to reduce fire fuel loads. Neighbors are joining neighbors to protect their homes and properties—nestled amid the heavy timber—from catastrophic wildfire.

It is all part of a bigger plan to fortify a three-county area in western Montana that is home to the city of Helena.

Wildfires have hit these counties—Lewis & Clark, Jefferson, and Broadwater—more than once. Many are hoping that the next time fire comes, it will be a different story.

Trial by fire

Local efforts to change the landscape of wildfire began in 1984, after a fast-moving fire swept through both private and federal land, jumping the Missouri River and burning into a designated wilderness area.

For many, the damage left an indelible mark. Clearly, a wildfire prevention effort was needed, especially since homes were being built in the area.

So Sonny Stiger, a retired fire behavior analyst with the U.S. Forest Service, organized the Tri-County Fire Working Group, a volunteer group of citizens, foresters, fire service personnel, elected officials and timber contractors from the three counties.

Initially, the group’s goal was to better educate citizens and local governments about wildfire mitigation as a means of reducing future fire losses.

Early efforts were painstakingly slow. There was little money to fund prevention education activities. And few people at that time recognized the long-term effects, and dangers, of an emerging wildland/urban interface.

Four years later, wildfire struck again—this time burning about 80,000 acres in Jefferson County. It was yet another wake-up call, officials say, that wildfire mitigation efforts needed to be stepped up. People were continuing to build and live in wildland areas, unaware that their choices were potentially putting them at risk.

Measuring the risk

The landscape in the tri-county area is breathtakingly beautiful, and perilous. Much of it is heavily timbered hillsides, steep slopes and native grasslands. The distant horizon is dominated by the rugged peaks of the Rocky Mountains.

Lewis & Clark County is the largest in population—about 56,000 people—and land mass, sprawling about 3,500 square miles. Roughly 66 percent of the land is government-owned. There are four federal forests and three designated wilderness areas, one of which, the Helena National Forest, spills over into neighboring Jefferson County.

Jefferson County adjoins Lewis & Clark from the south and borders the Helena metro area. It is about half the size and about one-fifth the population of Lewis & Clark but likewise is seeing growth, and risk, in the wildland/urban interface.

Broadwater County, just east of Jefferson, is the most rural of the three—about 1,200 square miles dominated by large ranches and forested areas on two mountain ranges that sweep down into a populated valley. About 4,400 residents live in the county, some with homes that hug timbered tree lines. Though Broadwater County doesn’t yet have the same level of residential development in the interface as the other two counties, the terrain and propensity for wildfire put the residents who are there at risk.

Mindful that the population growth would continue, the tri-county group launched a mapping initiative shortly after the 1988 wildfire to identify the level of risk for the interface areas of three counties.

Pat McKelvey and
Montana Governor
Judy Martz



The effort took years to complete because money to fund the work was in short supply, but the group's determination never wavered. In 2000, a grant from the Federal Emergency Management Agency (FEMA) helped finish the job.

The result is a Fuel Hazard Rating Map, which geographically shows the level of risk—from low to extreme—in the interface areas, much like a floodplain map does for flood-prone areas. The map now helps local, state and federal agencies focus their efforts and resources on wildfire mitigation projects in the highest-risk areas first. Current and future homeowners can use the map as well to see how vulnerable they may be to a wildfire.

Converging forces

In 1999, wildfire flared again. Several homes in Lewis & Clark County were threatened but this time there was a survivor—one home that had been surrounded by defensible space. Suddenly, wildfire mitigation was beginning to make sense.

That same year, Lewis & Clark County—also at high risk for earthquakes—pledged to become an all-hazards, disaster-resistant community. The move brought seed money and technical assistance to bolster its mitigation efforts. Little did anyone know that a virtual firestorm was about to strike.

Drought conditions in the summer of 2000 brought Montana its worst wildfire season ever. Months of fires claimed more than one million acres throughout the state.

In the tri-county area, there were at least five major fires—one of which cut off escape routes for wildland residents in Lewis and Clark County, preventing them from fleeing to Helena.

Fortunately, no lives were lost and countless homes were saved, which local officials attribute to effective firefighting. Nonetheless, the fires did take a toll, claiming nine homes and more than 50,000 acres among the three counties.

In the wake of those fires came a new understanding of, and commitment to, wildfire mitigation for both government officials and residents.

Mitigation fires up

Since then, there has been a flurry of activity throughout the tri-county area, which local officials credit largely to the efforts of Pat McKelvey, project manager for prevention and mitigation for Lewis & Clark County.

McKelvey was hired in October 1999 to coordinate the county's disaster-resistance projects. Now, he also facilitates the efforts of the Tri-County Fire Working Group, helping with project development, building public-private partnerships and finding the money to turn planned mitigation into reality.

On a grand scheme, McKelvey says, the biggest need throughout the three counties has been to reduce the fuels on which a wildfire can feed and spread.

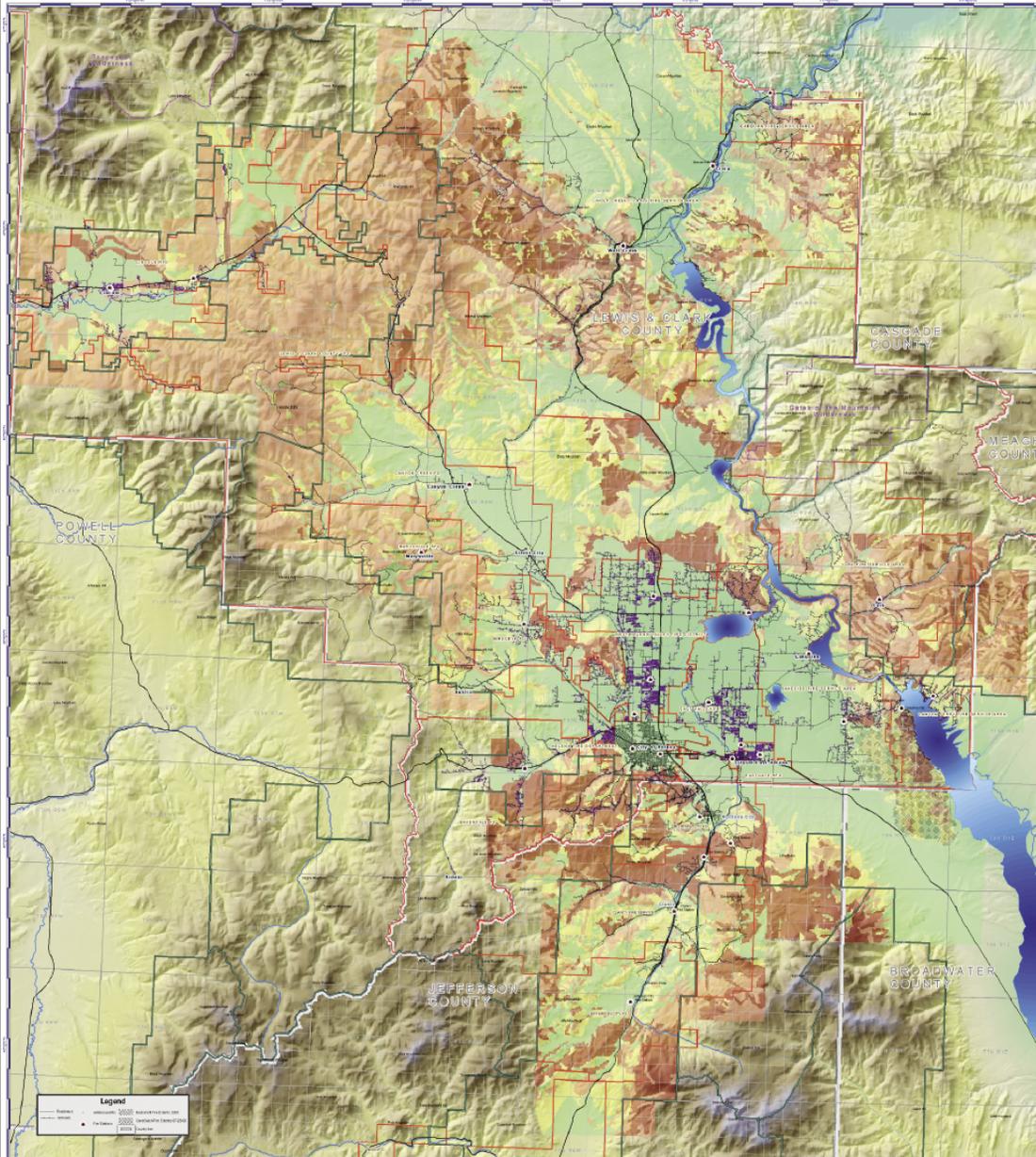
With such a large area in need of work, the Tri-County Fire Working Group turned to the Fuels Hazard Map to begin prioritizing its efforts.

The starting place was easy to pick. According to the map, the area in and around Helena is rated as an extreme danger because of the fuel loads there—a critical point given the city population and the interface growth.

So the group partnered with the city's parks department to create fuel breaks on Mt. Helena, a 950-acre city park that sprawls across one of two large hills at the edge of Helena.

Fuel Hazard Rating

Tri-County Area
Montana
2002
updated August 13, 2002
Counties of
Broadwater
Jefferson
Lewis & Clark



Note:
Ratings are based on slope and wildland fuel conditions at the time of the surveys. Hazard ratings are general and can be reduced.

FOR MORE INFORMATION ABOUT REDUCING YOUR RISK OF DESTRUCTIVE WILDFIRE CONTACT YOUR LOCAL FIRE DEPARTMENT OR:
the Montana Department of Natural Resources (DNRC) (406) 444-3633
the US Forest Service (USFS), Helena (406) 448-5499

FIELD WORK PERFORMED BY:
Montana Prescribed Fire Services, Inc. (MPFS) (406) 248-5307 HQ,
or (406) 238-4185 Field Office.

Fuel Hazard Rating

- 1 - High hazard (steep slopes, high fuel loads, high winds, etc.)
- 2 - High hazard (steep slopes, high fuel loads, high winds, etc.)
- 3 - High hazard (steep slopes, high fuel loads, high winds, etc.)
- 4 - Medium hazard (steep slopes, high fuel loads, high winds, etc.)
- 5 - Low hazard (steep slopes, high fuel loads, high winds, etc.)



A fire in that park could be devastating, beyond just losing the natural resources. If a wildfire were to burn up the slope, it could take out emergency communications towers atop the hill that service the sheriff's office and the fire dispatch center. Or, prevailing winds could easily push a fire down the slope and into Helena.

Using a combination of pruning and thinning trees, and removing "ladder fuels"—low vegetation that can spread a fire to the tree-tops—about 40 acres were treated on Mt. Helena and around two subdivisions on the city's south side that could be in the path of a fire. The fuel breaks will both slow the spread of fire and provide a buffer zone from which



Mt. Ascension

firefighters can mount a defense to keep a fire from spreading to the city. The \$77,000 project, funded by FEMA, was completed in 2003.

On the other hill, known as Mt. Ascension, the tri-county group hired a contractor to thin about 25 acres on a 144-acre tract of land—again to help better control a wildfire. The project now helps to protect about 25 homes within the city of Helena and has motivated adjacent landowners to create defensible space projects on their own properties, which increases the overall benefit of the work.

Bringing the message home

Though these two projects are considered critical first steps, McKelvey is quick to point out that successful mitigation takes more than treating public lands. It also takes the efforts of private landowners.

To that end, McKelvey and the tri-county group developed a program to help individual homeowners in all three counties at risk for wildland/urban interface fires better protect their residences.

The idea of the voluntary program is to encourage homeowners to do “disaster-resistant landscaping” up to 150 feet from their primary residences, with the aim of improving the home’s survivability in a wildfire.

Examples of approved landscaping methods include pruning trees, thinning densely

forested areas, cleaning up downed material such as trees and brush, and disposing of leftover vegetation debris.

To provide more incentive, participating homeowners can get 75 percent of their costs, or a maximum of \$1,000, reimbursed by the tri-county fire group. The homeowner must pay the remaining 25 percent—in cash or sweat equity—and anything above the \$1,000.

To determine eligibility for the program, a site inspection of the home and property is done by a member of the tri-county group to assess the level of fire risk due to vegetation. If the home qualifies, the inspector and homeowner jointly develop a defensible space plan for the property.

The homeowner then has a few months to have the work completed and the fire hazard abated. The treated condition must be maintained for 10 years or until the homeowner sells the property.

As of April 2003, about 220 homeowners in all three counties had participated in the program. McKelvey is using a \$250,000 grant from the National Fire Plan, a cooperative effort among the U.S. Forest Service, the U.S. Department of Interior and the National Association of State Foresters to help manage the effects of wildfires on communities and the environment.

McKelvey is pleased with the numbers and eager to see even more participation. The program was a hard sell in the beginning, because many homeowners like living in a wooded area and don’t want to sacrifice their trees.

“There’s a real anxiety here to cutting trees,” McKelvey says. “They think we want to come clearcut the trees out to 150 feet and that’s not what we’re doing. Mitigation work doesn’t mean totally removing all the fuel and the trees. They can still have an aesthetic landscape.”

In reality, McKelvey says, the landscaping work not only helps to reduce the fire risk,

but it promotes good forest health, provides wildlife habitat and preserves the beauty of the area.

The idea is catching on. McKelvey gets new applications for the program every week.

“We’re finding that once we do one property, we get more calls,” McKelvey adds. “Word-of-mouth and seeing these things done is the best way to spread the message.”

The tri-county group now has expanded the program to include larger parcels of woodlands that are not adjacent to a home and privately owned land that adjoins key roadways.

Paving the way

The landowner roadway projects are critical, McKelvey says, because they tie in with yet another tri-county project: roadside fuels treatments for public-access roadways.

The goal of the roadside mitigation project is to reduce forest fuels up to 150 feet on either side of roads that are open to the public. Doing so improves emergency vehicle access, increases the effectiveness of the roads as fire breaks, provides safe escape routes for homeowners in the area and enhances firefighter safety during a wildfire.

The projects—funded by another National Fire Plan grant—ultimately will provide a fuel break for the whole city of Helena, McKelvey says, because the roads generally parallel the city limits.

In another case, the existing road system that rings an entire subdivision is being treated, thanks to the efforts of the local homeowners’ association.

Though fuels reduction projects are helping to minimize a current threat, Lewis & Clark County officials also want to impact future development in the interface, thereby breaking the “disaster-rebuild-disaster” cycle.

To do that, they’ve created uniform Wildland Subdivision Standards that aim to better protect new residential developments in the county’s interface areas.



Chipping the slash on a hillside near Helena

The proposed standards—expected to be adopted by county commissioners in 2003—provide uniform, minimum requirements for such things as subdivision design, fire protection availability, water supply, access/evacuation, roof materials and fire protection plans.

Once approved, the standards will have the regulatory force of an ordinance and will ensure that future subdivisions mitigate for wildfire. The standards also will prevent development from increasing the fire hazard because of poor roads, lack of water and/or not providing defensible space around homes.

“With all subdivisions, you need ingress and egress, otherwise you put people, including our volunteer firemen, at risk and I personally refuse to do that,” says Mike Murray, a Lewis & Clark county commissioner and member of the tri-county group. “As an elected official, I will no longer approve a subdivision with the same egress. There has to be a second way out.”

Individual fire departments in Jefferson County do the same type of review, according to County Commissioner Tom Lythgoe, also a member of the Tri-County Fire Working Group.

Broadwater County Commissioner Elaine Mann said that all new subdivision plans in

that county also have to undergo a fire department review.

Giant step forward

McKelvey sees the group's accomplishments as a giant step forward. Still, he says, there is no quick fix to the dangers of wildfire.

"There's such an enormous amount of fuel out there," he says. "What we're doing is a drop in the bucket. But in the areas we've treated, we are absolutely better off. In the area of public awareness, we are substantially better off.

"We have seen a paradigm shift in the thought process for people in Lewis & Clark County," McKelvey adds. "People are accepting this mitigation work. They understand it's the stuff you do prior to a fire ever beginning. It's not things you do when the fire is raging over the hill."

Murray, a county commissioner for 10 years, agrees, noting "at best, we are twenty to twenty-five percent of what we hope to achieve.

"We have a lot of people who are moving in from urban areas who want the urban

dream," Murray notes. "They think the more trees you have around your home, the better. Part of the example we are showing people is that it can still look nice and be fire safe and not have trees up against your house and home."

In Jefferson County, Lythgoe is seeing the same domino effect which, in the long term, he says, is "going to save some homes."

Mann says Broadwater County is still in the infancy stage when it comes to wildfire mitigation. Changes are slow to come, she adds, because people still don't realize how and why they are at risk for wildfire.

"Our planners didn't realize there could be a grass fire that could burn subdivisions on the valley floor," she says. "Now they do."

As the Broadwater County representative for the tri-county group, Mann is trying to funnel back information to residents and other local officials to boost the need for education, which she considers fundamental to being proactive and facilitating changes on all levels.

Commissioners from all three counties agree that there is more to success than just doing the work. It takes an organized, visionary effort. It takes partnership and it takes money.

"You have to get the right folks to the table and you have to look for some money," says Lythgoe. "What has worked for us is to get multiple counties involved. We have commissioners, emergency services coordinators, state forestry people, staff from the Bureau of Land Management and the U.S. Forest Service all showing up to this monthly meeting, setting goals, achieving goals and problem solving."

And, Lythgoe adds, it doesn't hurt to have a powerhouse like McKelvey.

"The reason we are so successful is Pat McKelvey's enthusiasm and his ability to put these things together and get things done. He has done a really good job of making the public aware of the hazards of living in the forest." ■

Property with new defensible space



All Signs Point Toward Mitigation

Contest yields old-time jingles

MOTORISTS IN JEFFERSON COUNTY, COLORADO, are likely to encounter a series of six signs spaced a minimum of 200 feet apart along state and county roadways with the following advice:

*Our forests are dry
Our grass is drier
Don't be the one
Who starts
A fire
Jeffco Fire Minder*

The message is clear: Wildfire mitigation is an important activity in Jefferson County and everyone is encouraged to participate.

For those who traveled our nation's highways between the mid-1920s until the 1960s, the signs may bring back fond memories of hours spent in the car when the Burma-Shave™ ads helped break the monotony of long drives.

The idea to post messages in the Burma-Shave tradition originated in the fall of 2001 amid early predictions of a severe wildfire season in 2002. Jefferson County Public Information Director John Masson and County Attorney Bull Tuthill presented the idea and sample jingles to the board of county commissioners. (Masson says copyright is not a problem. While Burma-Shave products are still available, the sign concept is not protected.)

The three county commissioners supported the idea unanimously.

Masson immediately took charge of the project, digging in on two fronts. First, he had to find clever slogans to use, and second, he had to bone up on sign construction, installation and maintenance. Support from the commissioners was an important factor in making the project fun and successful, according to Masson.

"People were willing to bend over backward to expedite it," he says. "It helps to have the leadership of the county."

'If you have something to say, send it this way'

Masson sought slogans mainly through the Jefferson County Web site. He posted contest information on June 17, 2002, including a description of the roadway signs project, contest rules and how to enter. He also posted sample signs, including the following retired Burma-Shave sign as an example:

*The Blackened Forest
Smolders Yet
Because
He Flipped
A Cigarette
Burma-Shave*

By July 15, the contest deadline, 154 eligible entries had been submitted via e-mail from all around the country. Each submission contained a wildfire mitigation message expressed in five lines of up to 20 characters each. Masson's goal was to narrow the field



The inspiration for the Jeffco Fire Minder signs — an actual Burma-Shave slogan from 1960 (photographic reconstruction)

Burma-Shave is a registered trademark of American Safety Razor Company

“This is a positive kind of thing a community can do. This affects everyone.”

— John Masson

to 12 slogans, one for each of the county’s interface-zone fire protection districts, with one set to spare.

To choose the winners, he enlisted the aid of the county commissioners, along with representatives of Denver’s two major daily newspapers — *The Denver Post* and the *Rocky Mountain News*—and Jefferson County Open Space and Fire Safety Educators of Colorado.

Each judge was given a complete list of eligible entries. Nine stood out as clear winners and the remaining three were selected from among eleven runners up. By the end of October 2002, twelve slogans had been chosen. With the exception of one jingle-writer from Colorado Springs and another from Boulder, Colorado, all winners were from Jefferson County, including one person who penned two winning entries.

Just as the original Burma-Shave signs ended with a tagline, so too did Masson want to find a tagline for the Jefferson County signs. A contest was held among county employees to find one. The public information staff judged approximately 45 entries and Open Space employee Thea Rock won with her entry: “Jeffco Fire Minder.”

All contest winners received \$100 gift certificates and residential fire extinguishers with the following words of gratitude:

*Thank you for your winning entry
posted on signs that now stand sentry.
For penning for us this safety reminder,
we dub you a Jeffco Fire Minder.*

Behind the signs: process and protocol

From a motorist’s point of view the appearance of the roadway signs may seem serendipitous, but the process for getting them there was more complicated than meets the eye. Masson says many factors had to be considered before the idea came to fruition.

Cost. This was the first hurdle Masson encountered. The original estimate was \$300 per individual sign—a whopping \$1,800 per

series. That estimate was reduced to \$200 per sign with a volume discount. However, even at that, these estimates —based on using the county’s own antiquated hand-stenciling equipment — were still too high.

“I could have been very easily discouraged,” Masson says.

But he persisted, and when he found out that the county was getting new, state-of-the-art digitized equipment—dropping the cost to \$40 per sign or \$240 per set, including installation—he was encouraged. However, when plans changed to make the signs bigger and sturdier than originally planned, an outside contractor offered the best price—between \$90 and \$100 per sign.

Color. Original Burma-Shave signs were red with white lettering, but red is now reserved for stop signs and emergency messages in Jefferson County. Yellow is for cautionary warnings; blue is for information; white is for speed limits and other rules. Masson considered purple and green for the mitigation signs, but eventually chose blue with white lettering.

Placement. Masson asked the 11 county fire protection districts serving areas that are entirely or partially forested to identify a state or county roadway where they thought the signs would be most appropriate. For maximum effect, it was important to place the signs in high-traffic areas. Other factors included the distance between the signs and the road, and safety.

“If you’re trying to get somebody to read a sign and you’re on a curve, you don’t want them running off the road,” Masson says.

Regulation and durability. Requirements vary from city to city and within unincorporated areas of the county. There are rules about sign size, rules about the size of the lettering, and rules about the durability and reflectivity of materials needed to make the signs. Speed limits affect the size of signs and lettering, and then there are rights of way to be considered, managed by the Colorado

Department of Transportation. All of these variations affect cost.

In the end, the signs were constructed from heavy blue aluminum with an anti-vandalism coating. Eight-inch lettering was used (readable at up to 55 miles per hour), and the signs stand 12 inches high and are 48 to 96 inches wide, depending on the number of letters used in each individual sign.

Installation. The Jefferson County Road and Bridge Department installed the signs using a county-owned truck especially designed to do the job. Special equipment punches metal footings several feet deep into the ground, then signposts are inserted into the footings.

Masson says each sign required two posts. “They’re big enough in square footage that in a wind they can literally self-destruct,” he explains.

Plans to move the signs from one location to another have been made, so motorists who drive the same route often will get a chance to see several messages over time.

Maintenance. The fire protection districts play an important role in maintenance of the signs, reporting any vandalism or need for replacement.

“We want them to be the watchdogs and mentors for the signs,” Masson says. The districts may delegate some of that activity, enlisting scouts and other volunteers to be stewards of the signs.

The project took longer to implement than Masson had originally planned. The fire season started a month early for Jefferson County, and included part of the Hayman Fire, which broke out on June 8 and eventually burned 137,760 acres and 133 homes. It is considered the worst wildfire in Colorado history.

Masson contacted the fire chiefs in each of the 11 fire protection districts early in the summer. Two of them said they liked the program but were overwhelmed by fires. The project was slowed because of the wildfires, but it was not stopped.

The first signs went up in the spring of 2003.

Signs and sayings for other times and places

Masson can see further applicability for Burma-Shave-style signs beyond wildfire mitigation in Jefferson County.

“Some [of our] emergency providers have called to say there are other messages they’d like to get out, such as safe driving,” Masson says.

Even if the cost of the signs in Jefferson County had been closer to the original \$300 estimate, Masson is confident the commissioners would have supported the project because fire danger was so high and the commissioners were so strongly in favor of the signs.

“Anyone who’s been associated with wildfire knows about the impacts,” he says. “This is a positive kind of thing a community can do. This affects everyone.”

Funding could come from several sources. Masson suggests that businesses, chambers of commerce and volunteer organizations might support the project through direct assistance and fund-raisers.

The signs in production





A Fire Minder sign near Ken Caryl Ranch in Jefferson County

The key factor, he says, is broad community support. Cooperation is essential on the part of elected officials, emergency managers, fire protection districts and transporta-

tion supervisors. In addition, Masson points out that the project can inspire discussion and heighten awareness and all ages can participate. ■

The top six winners in the Jefferson County Fire Minder slogan contest

COLORADO MOUNTAINS	DON'T FLING YOUR BUTT	JUST ONE SPARK
ARE HERE TO ADMIRE	BESIDE THE TRAIL	IT IS NO JOKE
DO ALL YOU CAN	AND WE WON'T FLING	AND ALL OF THIS
TO PREVENT A FIRE	YOUR BUTT	GOES UP
OBSERVE FIRE BANS!	IN JAIL	IN SMOKE
JEFFCO FIRE MINDER	JEFFCO FIRE MINDER	JEFFCO FIRE MINDER
A MATCH OR BUTT	KEEP OUR FIRES	CARELESS FIRES
FROM CARELESS FOLK	WHERE THEY BELONG	IN A FLASH
OUR BEAUTIFUL FOREST	TOO MANY FORESTS	CAN TURN
GOES UP	ARE ALREADY	OUR MOUNTAINS
IN SMOKE	GONE	INTO ASH
JEFFCO FIRE MINDER	JEFFCO FIRE MINDER	JEFFCO FIRE MINDER

Cooperation Leads to Coordination

Cooperation at local level plays key role in Routt County, Colorado

PLANS HELP.

Plans spell out who will help fight wildfires, what equipment will be available, how local agencies and federal partners will work together, who will cover what territory, who will pay for what, and how the various parties will communicate (down to the level of telephone numbers and radio frequencies and repeaters).

Plans also become long-range planning tools, helping all the agencies involved in fighting wildfires acquire over time the training and equipment most needed in their area.

The state of Colorado thinks plans are so important that it requires them of any county that wants to participate in the state's Emergency Fire Fund (a fund the counties pay into regularly and from which money is available for fighting large wildfires).

But putting together a really good plan is not easy. Just ask the folks in Routt County, Colorado.

All issues considered

In 1990, Chuck Vale became the director of emergency management for Routt County, which surrounds the ski resort town of Steamboat Springs in the northern Colorado Rockies. Three years later, the sheriff asked him to develop a county plan for fighting wildfires. Colorado law gives sheriffs legal responsibility for fighting wildfires, and this sheriff delegated that responsibility to Vale.

Giving the job to the emergency manager proved to be advantageous. Vale says it created continuity. While the sheriff is up for reelection every four years, he has held his position for more than a decade.

"It was one of the great stepping stones of where we ended up," Vale says. "It opened the door for us to figure out cooperative issues."

Vale decided he did not want to create a plan that would just sit on a shelf. He wanted to make a usable document that would be short and to the point. As he says, "If nobody blows the dust off, what did we write it for?"



One of the difficulties in creating an efficient, usable plan is the number and diversity of the groups involved. They include federal agencies (such as the U.S. Forest Service and the Bureau of Land Management), state agencies (including the Colorado State Forest Service), county commissioners, the sheriff, the county and other local emergency managers, mayors and city councilors, and sometimes urban and rural fire chiefs. Some of the participants are primarily focused on land management, some on budgets, and some on firefighting—both structural and wildfire.

Routt County
Emergency
Management Director
Chuck Vale



Oak Creek Fire
Protection District Chief
Chuck Wisecup

Vale noted that in many cases policy makers signed plans while those who would actually be involved in battling blazes didn't even know about the documents. To prevent that, he included representatives from the county's six fire protection districts in the process.

As talks went forward, those present brought their own perspectives to questions small and large. Smaller concerns, for example, included matters such as who would pay for a chewed-up hose. The bigger issue, Vale says, was clarifying how to decide who was in charge of what fires, which is critical for reimbursement issues as well as for

organizing firefights. Whose area a fire is in, he explains, "is not real clear when you look at these wildland fires. The question becomes, 'Am I helping you or are you helping me?'"

The details and the diversity of perspective made for long discussions, but produced good results. Vale sums it up, "If we could get people to focus on their particular issue or gripe and find a solution to it in the document, they were perfectly content."

After hashing "just about every conceivable issue" a plan was developed. In addition to the plan agreed to with the federal agencies, the local participants also established the Routt County Wildland Fire Council, consisting of the fire chiefs, sheriff, county emergency manager, and attorneys representing the city of Steamboat Springs and the county.

All the local parties signed a memorandum of understanding, which committed them to coordinate on a plan for wildfire prevention and suppression, procedures for reporting and fighting wildfires, public education programs, training and budget requests to the county commissioners.

In retrospect, Vale says the plan was readily accepted in part because the stakeholders did not feel that they had anything to lose. During the relatively wet period that ended in the fall of 1999, the threat of major wildfires was minimal, so planning for fire was not a major concern and the wildfire demands on personnel and equipment were relatively few.

But that all changed.

The 'divorce'

On October 25, 1997, a violent wind-storm felled trees on 20,000 wilderness acres in Routt County. In a single day, the county had suddenly acquired a huge potential threat, as the mass of downed trees created the fuel for a possible major wildfire in the rugged hills. The blowdown was a harbinger of the problems to come.

The West was seeing the beginning of what proved to be a multi-year drought. The

incidence of wildfire increased throughout the whole region. In Routt County, the number of wildfire starts more than doubled in a year, from 44 in 1999 to 100 in 2000.

The fact that more and more homes had been built in heavily timbered areas and on steep hillsides also began drawing increased concern.

When the 93-acre Deguine Fire broke out in May 2000, District Chief Chuck Wisecup of the Oak Creek Fire Protection District was able to muster just 60 personnel and 30 pieces of equipment. “And that was pretty much everything in the county,” he says. “There is no single entity in Routt County that can handle a major incident on its own.”

Suddenly attention began to focus on exactly what resources the county had on hand to fight wildfires.

In November of that year, Vale and the other members of the Wildland Fire Council submitted an 80-page *Report of Findings and Recommendations of the Wildland Fire Council for the Routt County Board of County Commissioners*. The report pointed out “a lack of capacity and capability in... wildland fire throughout the county.”

Routt had only two paid personnel and 90 volunteers for all its fire, rescue and emergency medical services. Two departments did not have enough firefighters to meet minimum standards for structural firefighting, and three others barely did, which also meant it was “apparent there are no additional firefighters for mutual aid or wildland fire suppression extended attack.” If each department stuck by its commitment to keep a minimum level of coverage in its own district, the report pointed out, then “mutual aid... is non-existent[.]”

The report listed all the firefighting equipment in the county, which illustrated the problems with firefighting capability. As Vale said in reference to one piece of equipment, “If we’re going to continue to go into the interface, we’re going to have to do better than 1978 trucks.”

The obvious problems were bad enough. But the report went one critical step further. It recommended a “substantial budget contribution” from the county and the fire protection districts of approximately \$1.7 million over the next five years. It called for acquiring three engines and adding three seasonal firefighters each year over three years (for a total of nine firefighters).

Vale says projecting that estimate was “probably the biggest mistake of my career.”



Steamboat Springs Fire Chief Bob Struble

“Once we got everybody at the table, we made great strides.”

— Bob Struble

Already by that point, as the report records, city officials from Steamboat had said they probably would not sign the 2001 memorandum of understanding with the wildfire council unless the county pledged more financial support. Then, when the report called for the county and fire districts to put up \$1.7 million over the next five years, it seemed to some as if the city was trying to tell the county how to spend its money. As Vale says, “That’s like *me* looking at *your* checkbook and telling *you* how to spend *your* money.”

County commissioners said they were already going above and beyond what was required of them. The dispute sparked by the report resulted in Steamboat Springs pulling out of the Wildland Fire Council.

“This report is what divided the city and county,” Vale says. “This was the divorce decree.... We all agree when it’s a \$100 deal. But things change when you’ve got a \$100,000 deal.”

In practice, points out Steamboat Springs Fire Chief Bob Struble, the city continued to respond to calls outside city limits and participated in mutual aid with the other fire districts. But the split at the policy level halted progress in planning and improvements in equipment and personnel, leaving the overall wildfire strategy in disarray as the drought intensified.

Ironically, the \$1.7 million called for over five years proved to be far less than the actual cost of fighting the fires that erupted in 2002.

Difficult talks lead to ‘group hug’

A year after the “divorce,” Vale says, the various groups realized that “divorce isn’t going to work. We’ve got to work together.” Incumbents and newly elected officials began to talk, thanks largely to the efforts of Vale and the fire chiefs, along with Routt County Commissioner Nancy Stahoviak and Steamboat Springs City Councilwoman Nancy Kramer.

“We went for a year in limbo and fortunately it wasn’t a very bad year [in terms of

fires],” says Stahoviak, a commissioner since 1993. “We needed to figure out a way to get to the table to talk about this.”

She and others invited people from around the county to a dinner. “The whole purpose of the evening was just to have dialogue,” she explains. “It was really a productive evening because the people got to know each other and what the issues were in their areas.”

They decided to hold a series of meetings over the winter so they could come to agreement about the annual operating plan and the memorandum of understanding.

In the meetings that followed, it was as clear as ever that all the parties involved still had their different particular interests. “Each branch of government has different perspectives and responsibilities,” Vale points out. The various county, fire protection district and town organizations he was trying to bring together “don’t even agree on what day of the week it is sometimes.” All of their differences, including personality conflicts, came out.



“I believe petty issues are what tore us apart and I believe petty issues can tear us apart again,” Vale says. Even he had trouble at times keeping the large picture in sight. “I was too close to the forest,” he admits.

The participants got into details such as who calls dispatch, at exactly what point the mutual aid and financial arrangements kick in after a fire starts, and who pays for what, including who pays if one district’s equipment is damaged at a fire in another district’s territory. “Once we got everybody at the table, we made great strides,” Struble says.

The process was helped when a group from the Colorado State Forest Service attended one meeting. Vale says State Forester Jim Hubbard was “like a preacher. He gets people to pay attention, then once they’re hooked, he sells them on the idea of cooperation.” Vale says Hubbard probably used the word “cooperate” 50 times during the two-hour meeting.

“I am convinced in the big scheme of things Jim Hubbard is still correct when he says, ‘cooperate,’” Vale says. “People assume it, but it may be more an assumption than reality.”

In the process, the fire protection districts identified their needs and prioritized them, and then had the county’s support as they applied for grants. Three of the districts won grants after the 2002 agreement was signed, for a fire truck, a new fire station, and an addition to a station.

County Commissioner Stahoviak explains that when they approach potential funding sources, “The question is always asked, ‘How are you coordinating your efforts?’ With all the fires that have gone on recently, they are looking more closely at how well we’re working together.”

The county also supported mill levy increases in some fire protection districts. In another case, the cooperation extended to the county Road and Bridge department renting space from a new firehouse, which meant income in the six figures for the fire district while the department avoided having to build its own facility.



Steamboat Springs
City Councilwoman
Nancy Kramer

Another key step was realizing that the wildfire council would work better in two separate units, one to handle policy and the other to work on more practical field issues.

“The policy and field expertise had been getting mixed up,” says Nancy Kramer, a Steamboat city councilwoman who was elected in 2001. “One group was trying to take care of both and it wasn’t working.”

She recalls a meeting when an epiphany occurred that establishing the two groups would be an appropriate approach. “The lights went on,” she says. “There had been enough great work done that things slid into place. We’ve got all the parts. We just have to put them in the right place. In fact, we’ve got great parts.”

Under the new organization, the policy group consists of elected officials and some staff and meets approximately twice a year to discuss issues like taxes and overall policy. An

advisory group consists of fire chiefs and representatives of federal agencies and sometimes meets as often as twice a month to discuss issues like planning for fires and training. The two groups meet together at least twice a year and can schedule special joint meetings as needed.

At the end of the renewed discussions, the fundamental conflicts had been resolved, Vale says, and all the parties came together in “a big group hug.”

Process is ongoing

The true value of developing a detailed plan for firefighting in Routt County became clear in the summer of 2002, when Vale could see five columns of smoke from his office in Steamboat Springs. The firefighters were in for the biggest, longest firefight in the county’s history.

They faced 85 fires that summer, which burned more than 40,000 acres in federal land alone. But instead of infighting through that long season, the media reported cooperation and teamwork. “All summer there were positive stories and discussions about how ‘they came together and worked together’ and the end result was that we all worked well together out in the field,” according to Vale.

Struble agrees that the coordinating group meetings had made a tremendous difference. “Our elected officials were aware of what was going on,” he says. “They understood the issues.” He adds there was also a good understanding of the relationships and responsibilities of the six local fire protection districts and the federal agencies.

District Chief Bryan Rickman of West Routt Fire Protection District says the smooth operations were “really a culmination of all the work we did [the previous] winter.”

A success to be sure, but a plan that is really used is never finished. Vale is eager to keep working on the plan to make it even stronger. Particular areas where he sees a need for more specific planning include:

Emergency notification and evacuations.

The 911 call system became so overloaded when the 2002 fires broke out that people began calling the local officials they knew on their cell phones. The firefight also raised questions about evacuations: Who calls for them—the police chief, the sheriff? Can officials force people to leave? Physically, who conducts the evacuation? If a local area has one police officer and 150 homes, how does it get more officers quickly?

Clarification of county priorities.

Evacuations were impeded because one route was being resurfaced. In addition, the plan called for the water supply of the county’s Road and Bridge department to be available for fighting fires, but when fires actually occurred Road and Bridge needed its water. Firefighters had to rely on private water trucks, which had incompatible fittings.

Mutual aid. Vale feels that those who make commitments to mutual aid need to “be serious about what they’re writing down.” A provider may promise all of a department’s personnel, though some may be on other assignments or vacation. One source said three bulldozers and pumps would be available, but Vale says, “When I got ready to use them, I didn’t have any.” Further, in a hot, dry season like 2002, otherwise likely donors may themselves be in need of support. For maximum benefit, it’s important that a recipient of mutual aid know the capabilities of donated personnel and equipment. Vale says they are finding this problem to be deep and widespread.

Pay. Pay provisions among the fire districts were contradictory. According to one, everyone doing similar work on the fire would receive the same rate of pay. According to another, workers’ pay might depend on their position outside the particular fire.

Federal assistance. A series of small fires before the big ones provided opportunities for local officials to gain experience with federal paperwork requirements. But after those smaller fires, Vale says, “I thought the

fire chiefs were going to hang me. They were at the end of their ropes. How much more bureaucracy can you bring me?" The experience paid off when larger fires occurred. Still, the match between local needs and federal aid is imperfect. For example, the federal system works on a rotating schedule, bringing in new firefighting teams every 14 days. Consequently, on big fires the local teams must deal with new federal partners every two weeks. As Vale puts it, "Will you come and stay with me for the entirety of the fire, or will you just stay an hour? This is a huge issue."

Contracting. Purchase agreements set up in advance from the interagency dispatch center in Craig, Colorado, provided for portable toilets from across the county. Vale is interested in arranging such services through providers as close to the fire as possible. Similarly, he worked during the 2002 fire to have firefighters fed by guest ranches that were suffering a loss of tourism business, and would like to see that become standard policy.

Vale feels that the increased population in the wildland/urban interface zone and the accompanying increased fire risk call for a more robust response capacity, with more firefighters with expanded skill sets. A well-thought-out annual operating plan, such as the one in Routt County, can be an essential component of a robust response. It leads to better training, more personnel, more equipment, better coordination and tactics in fighting a wildfire, greater efficiency due to area coordination, better morale and better public support.

However, he cautions that the process for arriving at such a plan is apt to be uncomfortable. In Routt County, it involved disagreement and personality conflicts, as well as cooperation and compromise. Vale says it is important to come to the table ready to have disagreements. Working through them is a vital part of the process.

"The experience of going through the divorce helped," he says. "I'm pleased with the work we did in our county even though it was darn near suicide." ■



Restoring the Land with Fire

Fire as Spirit, Fire as Tool

MORE THAN 40 YEARS AGO, Silas C. Whitman, 66, was working with the U.S. Forest Service (USFS) in Northern Idaho battling a range fire in a canyon with his uncles and “some of the old-timers” from the Nez Perce tribe.

“We thought the fire had been contained,” Whitman recalled. “Then just before bedding down for the night, the fire came ripping out of the canyon, roaring like a freight train. A tornado of fire headed right toward us. Then it jumped over our heads into the air and disappeared as if taken by the sky. We thought it went down the hill and burned everything in its path, but it was completely extinguished. It was the fire’s last breath.

“Fire has a spirit. You don’t tease it. You respect it.”

These are the cultural truths taught to Whitman when he was growing up on the Nez Perce Reservation in north central Idaho. But at 20 years old believing is seeing, and on that starless night fire revealed itself to Whitman as a life giver and taker.

A speaker at the Colorado Mitigation & Wildfire Conference in September 2002, Whitman talked about fire as a living spirit, an intrinsic element that sustains the life cycle of the planet’s ecosystem. Whitman, president of a land rehabilitation company, told the audience that the ecosystem depends on people to keep nature balanced through the use of fire.

But for more than 100 years fire was consistently excluded from the American landscape by policy and practice, he said, resulting



in overgrown forests, drastically changed fire behavior and, according to foresters and fire ecologists, an increased number of catastrophic fires.

Only recently has a consensus begun to emerge about how to manage fire. Today, the USFS and other land managers are implementing a new national policy that calls for the reintroduction of fire, not only to reduce fuels in the wildland/urban interface but also to return forests to a healthier condition.

As a result, traditional cultures are becoming intertwined with modern fire science.

Fire as tool

For thousands of years, American Indian tribes across the continent shaped the land-

scape with fire. Today, scholars, researchers and anthropologists credit American Indians for creating the vast prairies in their quest for buffalo and other game.

Though not all tribes used fire to manage the land, Gerald W. Williams, in *References on the American Indian Use of Fire in Ecosystems*, said that researchers have concluded that American Indians utilized fire for several reasons.

According to Williams, “[T]here were some indications that fire was used to protect certain medicine plants by clearing an area around plants, as well as to fireproof areas, especially around settlements, from destructive wildfires.”

Other reasons included crop management, improving growth and yields, insect col-

Near Winter Park,
Colorado





“Firefightin’ 4 Life” — a member of the Ute Mountain Ute Firefighters

lection, pest control, clearing areas for travel, felling trees and clearing riparian areas.

Germaine White is a Salish Indian who lives at the base of the Mission Mountains on the Flathead Indian Reservation in Montana. White works at the tribal preservation office and serves as vice chair of the Lower Flathead Valley Community Foundation board of directors, as well as participating on many other committees and councils.

In an interview in the Fall 2001 issue of *Northern Lights* magazine, White discussed her tribe’s historical uses of fire:

[B]urning was to maintain campsites and keep the camp clean. They kept the trails groomed with fire. There are also many of our foods and medicines that have an important relationship with fire. They rely on fire for fertile seedbeds. That nice ash layer nourishes them. The canopy is opened, too, and all of their competitors are cleaned out. The horses benefited. Game also relied on the abundant grasses that came in after fire.... [F]ire was used in our daily life and that included our spiritual well being. Biologists talk about fire-dependent species. Well, that’s us. We’re a fire-dependent species.

Whitman said that in the California high chaparral of the Sierra Mountains, tribes performed prescribed burns on several hundred thousand acres as late as 1923.

“We’ve known for years that in order to prevent catastrophic fires, you have to reduce fuel loads,” said Whitman, who served as the Nez Perce fishery program manager for 13 years. “We understood about fire management to protect our watershed and fish population.”

After a burning they would find berries, herbs and medicines. “Nutrients flowed from fire,” Whitman said. Tribes developed a cultural science, even though it was not written down. Their traditional knowledge of fire ecology was passed from generation

to generation like the knowledge of crafting beadwork.

Added White, “Perhaps our people did not possess an encyclopedia knowledge of the land, but they had an intimate knowledge based on a collective, multi-generational understanding of how natural systems work, on millennia of observation, habitation and experience.”

According to both White and Whitman, not just anyone was allowed to burn. Igniting at the wrong time of the year or under unfavorable conditions could have been disastrous for those living close to the forest. In White’s tribe, only those who had expert knowledge were allowed to ignite vegetation.

“Sx paám is the [Salish Indian] name of the one whose task it is to set fires. It means he is setting the forest fires here or there and he is setting forest fires over and over and over again,” explained White. “This is a person who had an intimate relationship with and knowledge about fire and had authority to light fires.”

Northwest tribesmen would “pitch fire” to control a prescribed burn, which was referred to as a “climax fire” that would put itself out.

“They would light a torch at opposite ends of a field so the fire would meet and then burn out,” said Whitman. “If the fire did get out of control, they would light backfires to regain control of it.”

Whitman also said that tribes would hold meetings about fire land management at which they discussed the pros and cons of igniting the forests and when to do it.

Even though American Indians used fire extensively, European settlers did not, according to Whitman. While many American Indians were nomadic, most new settlers remained in fixed locations. To the European pioneers, igniting the forest threatened agricultural crops, commercial timber and communities made of wooden structures.

Cultures collide

There were various reasons why fire was limited on the North American landscape

once European settlement began, but most scholars, authors and American Indians agree that it came down to differing core values about how the forests should be managed.

“Early settlers and explorers came here and found the land to be very beautiful,” said Dana Salway, a firefighter and Salish Indian from the Flathead Reservation. “But they feared fire, which was the very thing that we used to maintain the landscape.”

Arizona State University professor Stephen J. Pyne, one of the foremost experts on the history of fire, wrote in *Fire in America* that the country’s need for commercial timber was also a fundamental motivation for the settlers to suppress fire from the landscape.

In 1878, John Wesley Powell, director of both the U.S. Geological Survey and the Bureau of Ethnology, said in his famous *Arid Lands* report that he wanted to save the forests from the wildland fires he saw ignited by American Indians in Colorado and Utah, which “destroyed more timber than that taken by the people of the territory since its occupation.”

Another major factor in the exclusion of fire was the Great Idaho Fire of August 1910, which destroyed several million acres in Idaho and Montana and killed 85 people.

According to Pyne, the burn was a turning point in American fire history because it drastically altered the way the country perceived wildfires. A year later, the USFS firefighting program was established, and with its formation a nationwide approach to wildland preservation focused on extinguishing all wildland fires.

As other government land agencies were established, they followed the USFS lead on fire suppression. With an aggressive suppression policy, the annual acreage destroyed by wildfires in the United States dropped from more than 40 million acres a year in the 1930s to 5 million acres by 1970.

But by completely suppressing wildfires without otherwise reducing fuels, the ecosystem was interrupted, altering the structure

and composition of forests and creating a tinderbox of diseased and overgrown forests.

Many trees that would have been naturally expunged from woodlands by regular, low-intensity fires instead became infected with disease and produced an unhealthy landscape.

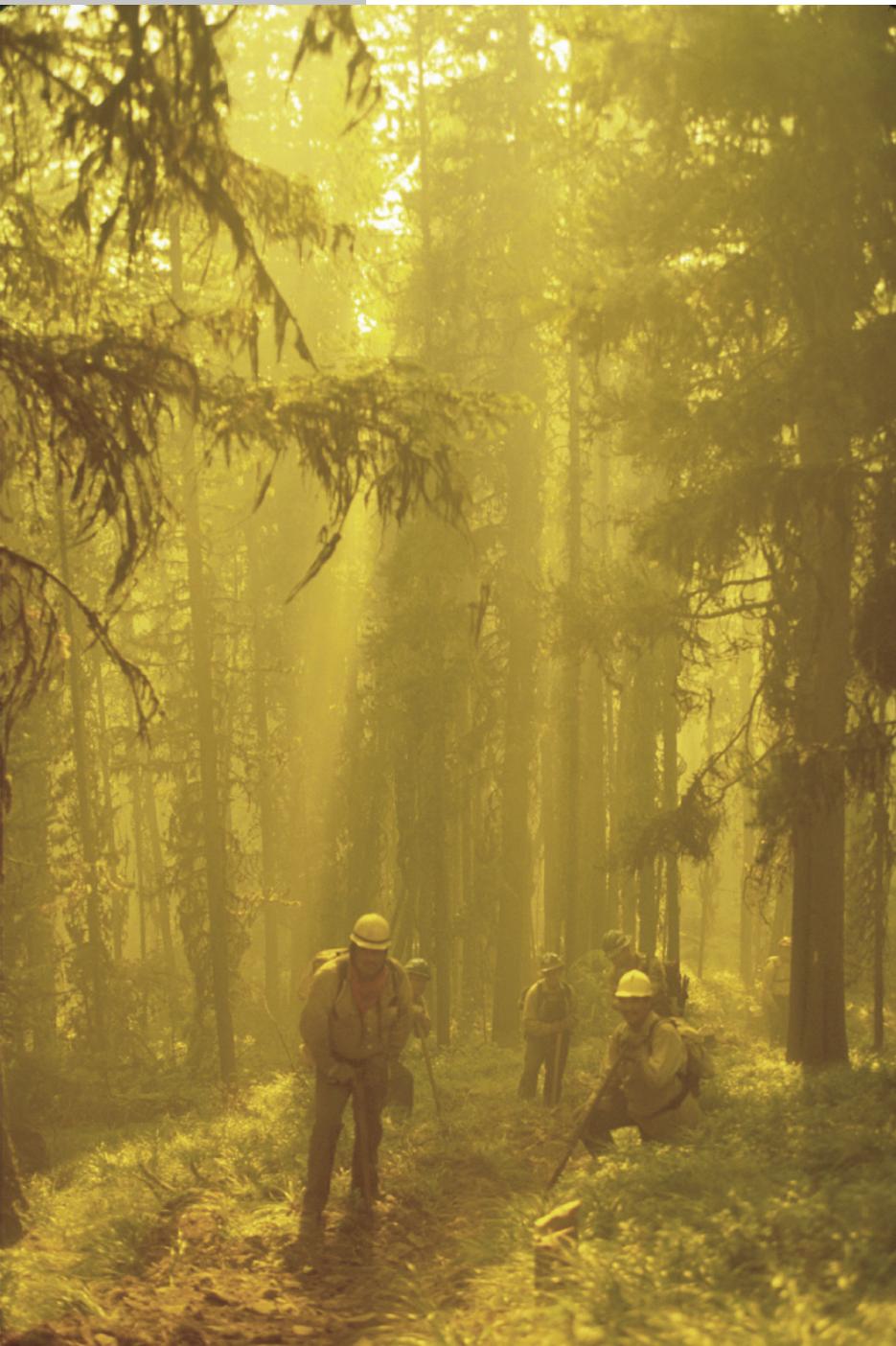
According to *Managing the Impact of Wildfires on Communities and the Environment: A Report to the President In Response to the Wildfires of 2000* (September 2000):

Over time, these trees became susceptible to insects and disease. Standing dead and dying trees in conjunction with other brush and downed material began to fill the forest floor. The resulting accumulation of these materials, when dried by extended periods of drought created the fuels that promote the type of wildfires we have seen this year.

In short, decades of aggressive fire suppression have drastically changed the look and fire behavior of Western forests and rangelands. Forests a century ago were less dense and had larger, more fire-resistant trees.... As a result, studies show that today’s wildfires typically burn hotter, faster, and higher than those of the past.

Members of the Ute Mountain Ute Firefighters during the Snaking Fire in Colorado, April 2002





Montana firefighters

In short, the exclusion of fire from the ecosystem contributed to an increase in the frequency and magnitude of wildfires.

Fire ecology

There was a short pause when Dan Bailey, USFS Wildland/Urban Interface Program Coordinator and National Fire Protection Association board member, was asked if he thought the aggressive suppression policy played a role in the recent rash of catastrophic wildfires since the late 1980s.

“That’s part of it,” replied the former firefighter. “There are fires that have to be put

out. The real issue is that in the past we have not looked totally at how to deal with fuels and vegetation from a management standpoint. It’s a tough situation to deal with and still is.

“Fires are part of the normal ecosystem of the land. Today there’s a different attitude about how to manage fire. We’ve done such a good job at suppressing in the past, we’ve built up the fuels. Now we have those fuels alongside housing developments. Now we’re trying to save lives and property and sometimes we’re stretched so thin, we don’t have the resources to combat the wildland fires.”

Firewise Communities/USA, for which Bailey is a workshop coordinator, is a national program designed to help communities survive wildland fire. The goal of Firewise is not to suppress fires, but to educate people living in the wildland/urban interface about how to create defensible space around homes, plan fire-safe subdivisions and build with fire-resistant materials.

Bailey cited other factors related to the increased incidence of catastrophic wildland fires.

“We’ve been in drought conditions for several years, with the expansion of homes and subdivisions being built in wildland areas not conducive to firefighting,” Bailey said. “More and more people are moving to wildland areas, from New York to Wyoming.”

Statistics support Bailey’s assertion. Eight out of the 10 fastest-growing states in the country are in the interior West. The average annual population growth nationally is about one percent, while the West is growing at a rate of 2.5 percent to 13 percent. As a result, communities are expanding into fire-prone areas, often adjacent to federal land.

“If fire enters the picture, it’s back to dealing with saving lives and property. Whether people see that as suppression or not, it’s what’s got to be done,” Bailey said. “What’s different today is that a lot of communities are learning about vegetation management and thinning around their homes and communities.”

As early as the 1930s there were land managers who tried to return the United States to a more natural fire regime. Prescribed burning is not a new technique with federal land management agencies, and there have been foresters conducting low-level prescribed burnings whenever possible during the last 40 years.

Those efforts, however, were often met with public resistance. Reasons varied throughout the country, but they included worries about prescribed burns getting out of control, destruction of buried cultural artifacts, air pollution, disturbing animal habitats and killing endangered plant and animal species.

But with the emergence of fire ecology in the 1970s, it became more apparent to land managers that fire was indeed an integral part of an interdependent system of plants, animals and the land.

Previous methods of managing the land would not suffice as more and more people moved into the wildland/urban interface and encountered fire firsthand.

The National Fire Plan

As the 20th century came to a close, wildland fire rivaled record-setting hurricanes and earthquakes for disaster headlines. The unprecedented Yellowstone fires of 1988 began a public debate about fire management after 800,000 acres of the national park burned.

More than 10,000 homes were destroyed by wildfire between 1985 and 2000. In 1994 alone, 34 firefighters were killed, including 14 on Storm King Mountain in Glenwood Springs, Colorado. A need for a new fire plan was clear.

At the request of President Clinton, the secretaries of Agriculture and Interior developed a response to the severe wildland fires making headlines in 2000. The result was the National Fire Plan, which included creation of a 10-year comprehensive strategy.

This strategy was developed by federal, state, tribal and local governments and non-

governmental representatives. Their objectives were to improve the management of wildland fire and hazardous fuels, and to restore and rehabilitate the ecosystem on federal and adjacent state, tribal and private forest and rangelands.

Nationwide, federal and state agencies are now reintroducing fire into the landscape in an attempt to return forests to a pre-fire-suppression condition. In 2002, land managers removed brush, small trees and downed material from 2.5 million acres on federal land, using small, intentionally set “prescribed” fires and mechanical thinning techniques.

After more than a century of suppression, fire had been returned to the ecosystem as part of a national, coordinated land management strategy.

Restoring a cultural landscape

According to Whitman, the “new” fire ecology is recapturing American Indians’ historical knowledge about the role and use of fire. White, for one, sees obvious benefits in bringing together traditional tribal values and modern fire science.

Having an opportunity for the managers and elders to work cooperatively could really benefit both groups. The elders can provide guidance and direction, the forest managers, science and technology. If that can happen we can build a powerful management program, a program that is sustainable because it is informed and guided by a culture with thousands of years of successful management experience and carried out by highly skilled professionals and technicians.

— *Germaine White*,
Northern Lights Magazine

The cross-cultural dialogue White envisions has already begun to occur between some government land agencies and tribes.

“We depend on tribal leadership to guide us on our projects concerning the restoration of their land and protection of their communities.”

— Dennis Dupuis

Bureau of Indian Affairs (BIA) Regional Wildland/Urban Interface Fire Prevention Manager Val Christianson works with tribes throughout the nation to reduce fuels on reservations. Part of his job is to make sure the BIA is in compliance with the tribes’ traditional and cultural conventions.

“We have a very active fuel reduction program that is very holistic,” said Christianson. “We work with the tribes and in some cases the tribe will actually take over the entire management on its reservation.”

In accordance with the National Fire Plan, the BIA National Fire Program Office located at the National Interagency Fire Center (NIFC) in Boise, Idaho, has implemented a nationwide program to reduce hazardous fuels and reintroduce fire to restore healthier landscapes on all federal tribal lands.

The BIA has been treating fuels under the auspices of the National Fire Plan since 2001. More than 195,000 acres have been treated on Native American land in the past two years at a cost of \$50 million.

“We are in constant dialogue with the tribes and tribal members about any work conducted on the reservations throughout the country,” said Dennis Dupuis, BIA-NIFC deputy of fire use and fuels. “We depend on tribal leadership to guide us on our projects concerning the restoration of their land and protection of their communities.”

According to Dupuis, the reintroduction of fire to a fire-dependent ecosystem has a two-fold objective.

“With prescribed burnings, fire can return to its natural role in the restoration, maintenance and healing of the forests and rangelands,” he said. “Second, the reduction of hazardous fuels adjacent to the urban interface and intermix will protect communities when wildland fire does break out.”

Near Santee, Nebraska, fire was reintroduced to the Winnebago Tribal Rangelands in order to reduce fuels and restore the land to pre-suppression conditions. The BIA and the Natural Resource Branch of the Winnebago

Agency, in cooperation with the Santee Sioux Tribe of Nebraska, began the restoration project in June 2001.

One of the goals of the 2,500-acre project is the eradication of the Eastern red cedar and the return of Native prairie grasslands—which were once dominated by Big Bluestem, Little Bluestem, Indian Grass and Green Needle Grass but which had become heavily infested with cedar, dominating much of the landscape.

The Santee Sioux tribe strongly endorsed the goals of the Winnebago Agency while making its own recommendations for a healthier landscape. The tribe’s concern for the return of its cultural plants to the landscape is what Whitman hopes to see continued throughout the country.

“Many of our culturally important plants have been threatened or endangered,” Whitman said. “Native Americans would like to use fire as a way to recover those plants.”

When the drought ends, Dupuis plans to move into full production of managing 200,000 acres of tribal land every year with mechanical thinning and prescribed burnings.

Whitman and White both see the National Fire Plan as a blueprint for restoring not just tribal land to a healthier condition, but all wildlands.

White envisions a landscape rich and abundant with traditional foods and medicines. “I see lots of animals. I imagine how enriched our language and culture would be, and how important those culture bearers would be who had the tribal knowledge of fire,” she said.

For Whitman, he hopes to see the next generation of American Indians combine fire ecology with traditional knowledge, in what he referred to as “cultural science.”

Whitman concluded, “We need to encourage land managers to use fire as a tool to shape the landscape and we need to educate the public to not be afraid of fire. You’re always going to have fire. You just have to contain it, as opposed to fighting it.” ■

How Homes Ignite

Building a better defense against wildfire

JACK COHEN COULD BE CONSIDERED the Sherlock Holmes of wildfire.

For more than 30 years, he's been working the same case.

He's been trying to unlock the mystery of wildfires—how they burn, why they burn a certain way, how they impact people, and why some structures survive a forest fire and others don't.

And he's hit upon an idea to better protect homes in the face of wildfire.

Cohen, 52, is a research physical scientist with the U.S. Forest Service in Missoula, Montana. He is a published author and nationally known expert on wildfires. He holds a bachelor of science degree in forest science with an emphasis on fire science, and a master of science in bioclimatology.

He's fought wildfires as a firefighter and, as a scientist, seen countless others in action.

He's conducted extensive experiments to better understand fire physics, fire behavior and the effects of wildland fires on forests and structures.

He's dug through the remains of hundreds of homes and buildings that have succumbed to wildfires.

What he's learned is that protecting your home from wildfire can be done—and it's the little things that count.

Understanding fire

Before you can decide what to do, Cohen says, it helps to know something about fire and to understand what puts your house at risk.

For fire to occur, you need three elements: fuel, heat and oxygen. Take away any one of those elements, and a fire can't continue to burn.

To actually catch something on fire, it takes direct flame contact with a fuel or intense radiant heating that breaks down that fuel to the point where it ignites.

In the context of fire, "fuel" means anything that will combust, or burn.

In a wildfire setting, that fuel can be things like tree foliage, dead pine needles,



grass, wood, patio furniture cushions, even brooms.

So how do structures ignite? There are three basic ways:

- ✓ When fire creates such intense radiant heat that a nearby combustible starts burning;
- ✓ When the fire burns right to an object or right to the structure, causing the flames to directly touch and ignite something that will burn; and
- ✓ When fiery embers, also known as firebrands, fly through the air and land on the structure or one or more combustibles, starting a fire.

Tackling misconceptions

So how do you know if your home is at risk from a wildfire?

Quite simply, if you live in or adjacent to a wooded area, you're at risk. If you live on or near grasslands or a prairie, you're at risk.

But just how big is that risk and what causes it? The answers might surprise you.

There are many misconceptions about wildfires, Cohen says. One of the most common is that houses burn down because they are overrun by fire.

"Our perception is that this great flame front comes through and it travels everywhere and incinerates everything," Cohen says. "Except that's not how it happens. You can have a very intense fire with big flames, but more often than not, it's not the big flames that burn the house down."

Here's why.

“...what we learn...is that it doesn't take big flames to burn the house down.”

— Jack Cohen

Crown fires — where flames spread from treetop-to-treetop—tend to consume their fuel in about 60 seconds, causing them to burn out before they can ignite most structures, Cohen has found.

For crown fires to ignite the wood wall of a house, the flames have to be within 100 feet of the structure. Though that scenario does happen, it's not as common as people think, he adds.

Another misconception is that houses burn because forest fires give off such intense heat. We assume if a fire is hot enough to burn us as people, it is also hot enough to quickly ignite wood.

But Cohen's studies have shown that it takes far less heat to cause a burn on a person than it does to catch other things, such as wood, on fire. A heat exposure that can give a person a second-degree burn in five seconds takes more than 27 minutes to ignite wood.

While intense heat can cause a wood wall to burn in less time than that, it usually has to be within 100 feet of the house to occur, Cohen says.

Greatest threats

So what does pose the greatest threat to houses?

Most often, it's the firebrands — little fiery bits of burning embers, usually wood pieces, which shoot off from the main fire and get carried to other areas by fast-moving air currents.

A high-intensity fire can produce a virtual blizzard of firebrands, much like snow. And some firebrands can travel more than a mile before landing, Cohen says. When the embers do come down, they often start other fires if they land on something that can burn.

What makes firebrands so effective in igniting fires is that there can be thousands of them, depending on what's burning in the forest, and that they can get into the smallest of spaces.

In short, a firebrand can easily start enough of a fire to burn down an entire house.

“The firebrand size that becomes effective is a quarter-inch piece of branch, one-inch to three-inches long, that's come off a burning tree,” Cohen says. “There can be a bazillion of them flying around in the air. That size is quite common and quite effective in creating ignitions. The same hot and dry conditions that foster extreme fires enhance the ability for those firebrands to ignite something.”

Cohen has seen the mark of firebrands time and again during fire investigations of burned houses from coast to coast. Some of these examples came from wildfires in Laguna Beach, California (1993); northeastern Florida (1998); Los Alamos, New Mexico (2000); the Bitterroot Valley of Montana (2000); and Durango, Colorado (2002). In each place, Cohen found structures that were completely destroyed, even though the trees and vegetation around them hadn't burned.

“In many cases, we find out that houses are totally destroyed with unconsumed vegetation surrounding the structures,” Cohen says. “The first clue is that the vegetation isn't as flammable as the houses. That means that whatever destroyed the house didn't catch the vegetation on fire. And what we learn from that is that it doesn't take big flames to burn the house down.”

Those findings, which he has seen in an estimated 70 percent to 80 percent of the cases he's investigated, just reinforced what he had already learned from studying fire behavior and other field experiments.

It's the little things that count.

This home in the Bitterroot Valley, Montana, survived a crown fire just 300 feet away



Home Ignition Zone

In the course of Cohen's research, a pattern began to emerge. And it led him to create what he calls the "Home Ignition Zone."

Basically, the Home Ignition Zone determines how vulnerable your house is to wildfires. Cohen considers "the zone" to begin with the house and include everything within 100 feet of the home. By reducing the flammability of your house and everything else within the zone, you can greatly lessen the chance that your home will catch fire, even with a raging crown fire nearby.

"The Home Ignition Zone principally determines vulnerability to all the things that can ignite the house—the flames and the firebrands," Cohen says. "At a very minimum, you want to make sure that there is no fire within 100 feet of your house and then no big flames within 100 feet."

Anyone can create "the zone." In fact, it will be your principal defense against an extreme wildfire.

To begin, Cohen recommends starting with the house and working your way out. Keep in mind the "little things" that can contribute to fire ignition and spread.

First, assess the roof. The right roof covering is essential to protecting your home because the top of the house is so vulnerable to firebrands.

"A flammable roof will make the difference of your house being destroyed and not being destroyed, regardless of what else you do," Cohen says.



A firebrand this small can ignite a house

The most common flammable roof covering is wood shake shingles. If the shingles don't have a *pressure-treated* fire retardant, they could be a hotbed for fire, Cohen says.

Merely applying a fire retardant to the outside of the shingle generally isn't good enough in the long run, he adds. Sun and rain can cause the retardant to break down, leaving your shingles unprotected long before your roof wears out.

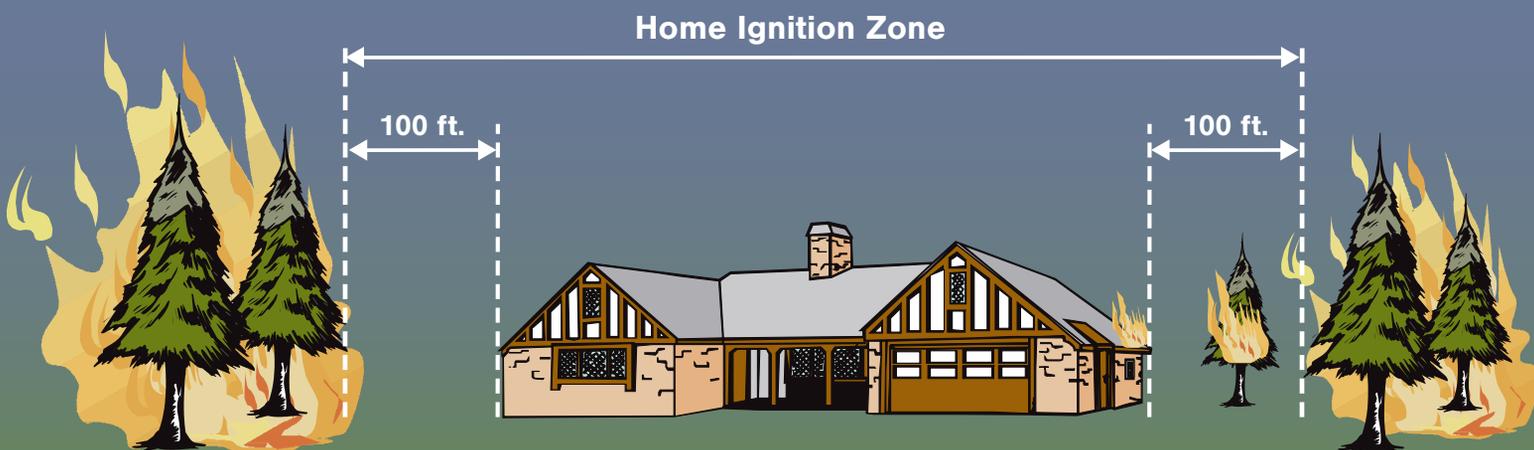
To know whether your shake shingles are fire retardant, Cohen suggests this experiment:

"Go find the edge of a shingle and take a pocket knife and cut a strip of wood off that edge," he says. "Holding the splint vertically, ignite the bottom edge. If it won't sustain flaming without a match or lighter on it, then very likely the fire retardant treatment is still working. And that's good news because it will inhibit firebrands."

Ultimately, he says, you want a non-flammable roof, which is any covering other than flammable wood shake shingles or thatch.

Roofs covered with composition shingles, metal, slate, clay tile or terra cotta tile fit this bill. If you have terra cotta tile, make sure the open spaces around the tile are filled. Otherwise, firebrands can fly into those gaps and ignite the house from the inside.

Cohen considers "the zone" to begin with the house and include everything within 100 feet of it





Jack Cohen explains how firewood stored beside a structure can be a serious problem

Survey the house design

Look at the architectural features of your house. Are there areas where firebrands can collect and start a fire?

Dormers, split-level roofs and lots of nooks and crannies create the perfect nest for burning embers. Pay particular attention to any and all inside corners. That's where firebrands can easily pile up, Cohen says.

Wherever possible, cover those corners. Metal flashing, like that used to redirect water on roofs, is very effective because the firebrands will land on the metal rather than a surface that readily burns.

Check your gutters to ensure they are clear. They can be a haven for pine needles, leaves and other flammable debris.

While you're at it, eyeball the eaves. They're a favorite place for birds to build a nest. And that could be a heyday for a firebrand.

Remember, too, that vents provide the perfect opening for a firebrand. So add a one-eighth-inch metal screen over the vent opening to create a barrier.

At ground level, the rule is the same — corners, corners, corners.

"Think about where snow accumulates in the wintertime, where leaves accumulate on a day-to-day basis, where trash blows," Cohen says. "Those are the locations where you can start accumulating things that will catch on fire and also where the firebrands will collect."

In those corners, make sure other combustibles, such as grass or leaves, don't pile in an inside corner — especially on a flammable surface.

Take a walk around

Next, walk around your house. Stop and look at each side. Visualize if there is anything there that can or will easily burn. Look for the little things.

For example, is there dry grass growing up against or leading right to the foundation that could then ignite a nearby wood wall? Are there pine needles or leaves lying around that lead to the house? Is there dead vegetation underneath bushes and shrubs? Is there a woodpile next to the house or on the home's deck?

Remove anything that will burn, especially if it's close enough to the structure to catch it on fire. Then make a point to keep those areas cleaned out at all times.

Take notice of your everyday "stuff" as well — patio furniture cushions, hemp doormats, brooms, recycling bags. Consider alternative locations to keep firebrands from reaching them.

Treat attachments to your house as though they are part of the house when looking at the fire danger — and your risk.

That means paying attention to things like attached garages, breezeways, wooden fences, wooden decks, and walkways made of wood planking or covered with wood chips — especially if those paths trail right to your house or to an adjacent outbuilding.

"If it's attached to your house and it's flammable, consider it part of your house," Cohen advises. "You don't want fire to be touching it because it can lead the flames right to your house."

Consider replacing a flammable walkway with stepping stones or crushed rock. If you have a wooden fence touching the house, break the connection with a metal gate.

Scout out openings like exterior crawl spaces or the critter zone under wooden porches and decks. If there's flammable debris, such as leaves and pine needles underneath there, remove it. Then screen the open area using one-eighth-inch metal mesh to create a barrier for firebrands.

Consider building a bin for firewood, again, to keep firebrands from landing on top of or in between pieces of stacked firewood.

Vegetation counts

Vegetation is part of the fire risk, too. So focus on what's growing around your house.

"Flame contact with the structure is a bad idea, so let's not have anything burning within ten feet," Cohen says.

Remove any dead plant material. Think about creating a buffer zone of rock around the base of the house with non-flammable plants, such as irises and pruned shrubs—all of which can help keep fire away from your structure.

If you have trees, figure out what kind they are and how close they are to any structures. If you need to, consult a forester or landscaper for help in identifying the tree species. It's a little thing you'll need to know to assess your risk.

By and large, Cohen says, live deciduous trees do not support high-intensity fire in the treetops. But conifers or evergreen broad-leaves—such as live oak—can. If those trees are in a dense-enough patch, they can support *a lot* of high-intensity fire.

If you have high-risk trees, it doesn't mean you're doomed.

"You don't have to cut all the trees down around your house," Cohen notes. "You don't have to live in a parking lot to succeed. But you do need to recognize that you may have to thin out the trees."

Single trees or small clusters of three to four trees can be OK as long as the tree canopies have a 20- to 30-foot separation from other clusters of trees. You want that spacing to keep fire from jumping among the treetops and possibly to your house.

If the trees within your 100-foot zone are denser than that, thin them out to avoid problems during extreme wildfire conditions.

Prune all trees so that the lowest branch material is approximately eight feet off the ground, Cohen advises. That helps to keep a low-intensity surface (ground) fire from



igniting the branches and spreading to the rest of the tree.

If the area around your house is not wooded, but surrounded by grasslands or prairie, you can and should create "a zone" as well by cutting your grass.

"Mowing the grass 30 to 60 feet from our structures significantly reduces the intensity of a prairie fire to the point where you won't be igniting your home or outbuildings as long as you don't have dead grass leading right to the structures," Cohen says.

"You don't need as large a zone for a prairie as you do for a conifer forest because a grass fire doesn't produce as high-intensity of a fire as we see in the forest," he adds. "Grass and prairie fires tend to burn at a lower intensity and for shorter durations."

Though burning grass also can produce flying sparks that can touch off other fires, Cohen says, the problem isn't as prevalent as firebrands from a forest fire.

Lastly, if a neighbor's house is within 100 feet of yours, it can be a fuel source for your structure. So get together and create overlapping Home Ignition Zones.

"The neighborhood that doesn't work together to reduce their vulnerability to fire will surely burn together," Cohen says.

The bottom line is that you can defend yourself against wildfire. And "the zone" can help you do it.

"You don't have to live in a concrete-block house with stainless steel garage doors and a metal deck all the way around it," Cohen says.

You just have to remember—it's the little things that count. ■

If flammable materials are not removed, an overhang can provide an easy way for fire to spread to a house

Living with Fire

Communities Reduce Risks with Firewise Concepts

ROBIN WYATT-LITTLE GETS EMOTIONAL when she talks about the brave men and women who put themselves in harm's way to protect lives and property from fire.

In June 1999, Wyatt-Little came face-to-face with the Hillside Fire just outside the central California town of Kernville. From a mountain-top, she watched as the out-of-control blaze edged its way up a slope toward her home. Flames on the other side of the road below the home trapped her husband.

"The fire trucks couldn't rescue him," Wyatt-Little, 60, recalled. "At 66 years of age, he ran up our small mountain and escaped the fire to safety."

A few hours later, the fire was contained and Wyatt-Little drove down the mountain expecting to see complete devastation.

"But as I went down the road, here was each home rising out of the ashes, with these little oases of homes still intact. And I was just amazed! It was one wonderful surprise after another," she exclaimed.

Wyatt-Little told her story at a 2003 Firewise Communities Workshop in Bakersfield, California. The fire had come within 20 feet of her property and she had nothing but praise for the firefighters who contained the blaze. Not a single house was lost.

"I still get goose bumps when I talk about it because I describe this as feeling like a child when you see a fire truck coming up the road. It's like your parents are coming to take care of everything," she said.

"A few days later, I was told that maybe that's not the healthiest attitude about firefighters, but it was an honest assessment on my part because I had not experienced this before. I'm from Buffalo, New York. What do I know about wildfire?"

It turns out that Wyatt-Little knew enough to help keep her home and community from burning. The defensible space that she and her homeowners' association had created was the reason for all the "oases" she saw that June day.

In April, only two months before the fire broke out, the Kern Valley Fire Safety Council had given a presentation at one of her homeowners' association meetings.

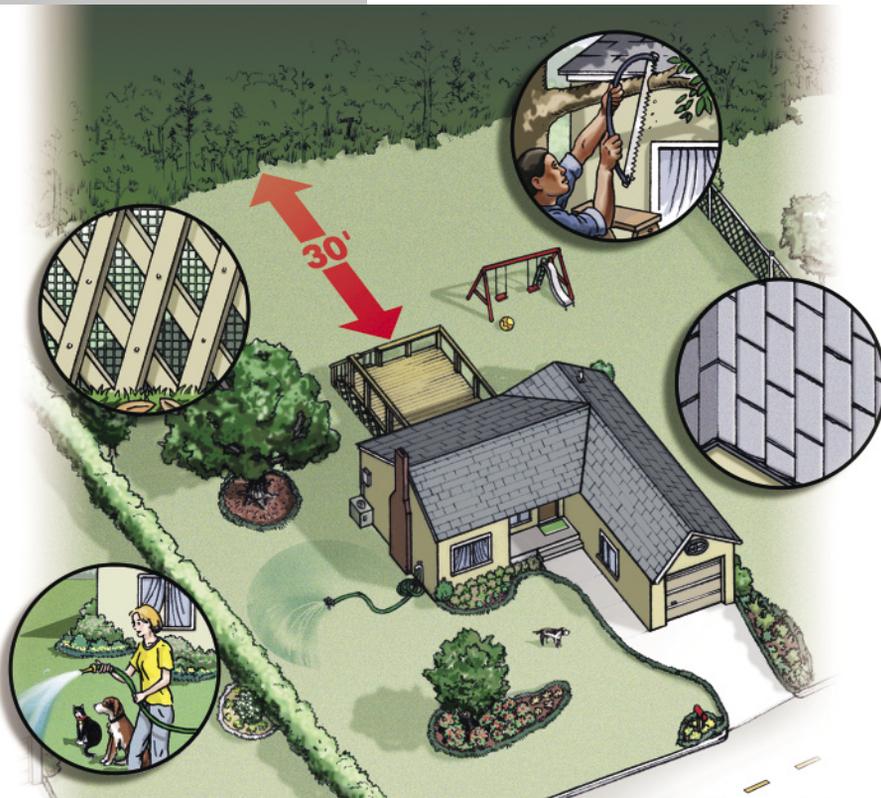
"They scared the daylights out of us with a wonderful video on wildfire," Wyatt-Little recalled. "Within a week, I saw people out there clearing and creating their defensible space. What we were soon to learn and realize was that defensible space works."

It wasn't long after that first wildland fire experience that Dan Anglin, coordinator of the Kern River Valley Fire Safety Council, called to ask if she would join the group.

"So now I'm the first one to get out there and beat the drums for defensible space," she said, adding a final thought before breaking down in front of the 125 Firewise workshop participants. "I get real emotional for all of you who work on our behalf to make us safe."

Perhaps Wyatt-Little didn't realize it at the time, but she had broken the cycle of being a fire victim. She too was now working on behalf of people in making them safer from fire.

A diagram provided by Firewise on their Web site to help home owners construct defensible space



Across the country, attitudes and policies are changing from the traditional view of firefighters as “protectors” and homeowners as “victims” of wildland fire. The paradigm has shifted from “protector-victim” to “partner-partner.”

Wyatt-Little had gone from being a potential victim of wildland fire to an empowered partner and protector of her own community.

What is Firewise?

Firewise is an idea that has been long in coming but is now catching on throughout the country.

It was the devastating wildfires in 1985 that got the attention of fire service professionals, who began to see a growing number of fire losses in wildland/urban interface areas. That year, wildland fires claimed more than 1,400 homes in California and Florida alone.

A year later, the National Fire Protection Association (NFPA) and the U.S. Forest Service (USFS) held a conference with professionals from many disciplines and agencies to help define the issues associated with living in the wildland/urban interface.

“At first we coordinated and dealt only with the government agencies and fire safety organizations to address this growing problem,” said Dan Bailey, USFS Wildland Urban Interface Program coordinator and NFPA board member.

“But with more and more fires in the early 1990s, our thinking shifted away from government dependence on finding solutions,” Bailey added. “We came to the conclusion that we had to share the problem-solving with the communities at risk, and that’s the concept we’re dealing with now — the community.”

The result is Firewise, initiated in 1999 by the National Wildland/Urban Interface Fire Working Team, a consortium of federal agencies and national associations.

The team’s goal for the program is not only to address current wildland/urban interface issues, but also to shape a future



www.firewise.org

where homes and businesses are built to survive wildland fires without direct help from firefighting resources. If that can be accomplished, officials say, then the limited resources can be focused solely on controlling the wildfire.

By February 2003, more than a dozen communities in Arizona, California, Colorado, Florida, Idaho, New Mexico, Washington and Utah were participating in the Firewise program, which has earned a National Fire Plan Award for its commitment to training communities to be more resistant to catastrophic wildfires.

About the workshops

One of the most successful elements of the Firewise initiative is the workshop format that is used to get the ball rolling in a community.

The workshops — which bring together homeowners, planners, community leaders, fire service representatives, architects and developers — are designed to show individuals how to perform wildfire risk and hazard severity assessments and how to build partnerships within their own communities.

Beginning in 2000, the workshops utilized an interactive approach that teaches participants to plan and implement basic fire resistant community development practices.

The participants use Geographic Information Systems (GIS) mapping software to apply real-life lessons in a fictionalized setting.

GIS allows participants to spatially depict land use, subdivision design and fire protection planning issues in a dynamic format. Maps can be produced for presentation or evaluation purposes, and computers enable more extensive assessment analysis and rapid decision-making.

Workshop participants then divide into groups to learn how to conduct wildland fire risk and hazard severity assessments for the fictional communities of Bear Heights and Lake Heights, in the fictional Falls County. Once the groups determine the fire hazard ratings, participants look at ways to reduce those hazards, using a community-based approach.

“What’s great about the Firewise workshops is that they empower all the players,” said workshop participant Jody Lyle, a fire information and education specialist for Sequoia and Kings Canyon National Parks. “The workshop makes everyone responsible for a safer community.”

As of February 2003, Firewise had conducted 20 workshops throughout the country, reaching more than 2,000 participants from almost 800 communities in 47 states. For more information on workshop dates and locations, visit the Firewise Web site at www.firewise.org/communities.

Follow-up and support

Once participants complete the Firewise Communities Workshop, they have access to a variety of tools and resources that can help them create their own community fire management plan.

To help implement Firewise principles within a community, the program provides additional support features including the Web site, resource materials, follow-up technical assistance, computer software, textbooks and other publications.

“Firewise is more than just our workshops,” Bailey emphasized. “Our organization keeps participants and others informed of Firewise concepts through numerous educational projects.”

The program also encourages outreach by partnering with local businesses.

“We’re working with Home Depot, Lowe’s and Ace Hardware with kiosks that demonstrate the kind of fire hazards facing communities and what kinds of materials individuals should incorporate into their homes in order to protect them from wildfire,” Bailey said.

Breaking the cycle

The success in Kernville, California, is exactly what Bailey hopes Firewise will generate nationwide.

“What we learned about the wildland/urban interface problem is that we really need to keep the focus on the homeowners and the community,” Bailey said. “That’s where the constant changes occur.

“The community is part of the solution. We want to empower each individual in the community so they are no longer caught up in the cycle of the ‘protector-victim,’ where firefighters come out to save every home while trying to battle the fire.

“Our goal is to train communities on how to build fire-resistant homes, have better urban planning and create defensible space so they become their own protectors from wildland fire.”

It is an idea that works. ■

IS YOUR COMMUNITY INVOLVED?



America's FIREWISE partners are gathering to create the next generation of FIREWISE Communities.

Community leaders and professionals will be handpicked to become part of a FIREWISE project for the new millennium: the FIREWISE Communities Workshop series.

Visit our web site for workshop locations and dates.



FIREWISE
COMMUNITIES™

www.firewise.org

This is a general purpose quarter-page ad provided by Firewise for a community's specific needs

How To Be A Recognized Firewise Community

More about
Firewise

THE PROCESS TO BECOME a recognized Firewise community is simple, regardless of where you live. Here's how to get started:

Step 1: Contact Firewise

Notify the Firewise Communities representative in your state or log onto the Firewise/USA Communities Web site at www.firewise.org to express your interest in starting the process.

Step 2: Site Visit

A wildland/urban interface specialist will contact you to schedule a site visit. This visit will be coordinated with local fire officials. During the visit, your specialist will collect information for a community assessment.

Step 3: Community Representatives

Gather together community representatives and create a multi-disciplined Firewise board. Besides homeowners and fire professionals, this board can include planners, land managers, urban foresters and/or members of other interest groups.

Step 4: Assessment & Evaluation

Once the community assessment and evaluation are completed, the wildland/urban inter-

face specialist will schedule a meeting with your Firewise board. The assessment and evaluation will be presented for review and acceptance.

Step 5: Create Plan

The Firewise board will use the assessment information to create agreeable, area-specific solutions to your wildfire issues. The specialist may work with your community to identify and seek project implementation funds, should they be necessary.

Step 6: Implement Solutions

Local solutions will be implemented according to a schedule designed by your Firewise board and the wildland/urban interface specialist. This includes creating a permanent Firewise task force or committee to maintain the program into the future.

Step 7: Apply for Recognition

You can apply for Firewise Communities/USA status when your implementation plan and one local project have been completed. The National Firewise Program will confirm receipt of your application package. Application forms are available on the Firewise Communities/USA Web site. ■

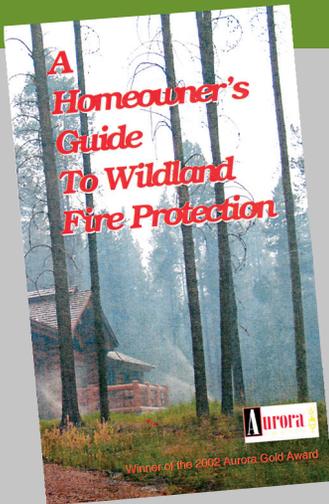
This house near Jackson Hole, Wyoming, shows excellent defensible space provided by the clearing in front and the driveway in back

RECOGNIZED FIREWISE COMMUNITIES

Briargate, Florida
Emigration Canyon, Utah
Genesee, Colorado
Greater Eastern Jemez Wildland/Urban Interface Corridor, New Mexico
Hyde Park Estates & Aztec Springs, New Mexico
Perry Park, Colorado
River Bluff Ranch, Washington
Sundance, Utah
Timber Ridge, Arizona
Wedgfield, Florida
Whiting Woods, California
Wilderness Ranch, Idaho



Resource Guide



A Homeowner's Guide to Wildland Fire Protection

Video

Cost: \$8.20 including shipping. *Order from:* Jackson/Teton County Fire Department; P.O. Box 901; Jackson, WY 83301 or call (307) 733-4732.

Suggested audience: Homeowners/Fire Service and Educators/Businesses

Are You Firewise?

Video (11:00 min.)/Notebook

Introduces basic points homeowners need to consider and steps to take to protect homes from wildfire in wildland/urban interface. Attempts to make homeowners look at their property's hazard risk the way fire professionals do. Useful for planners, fire personnel and local officials. The "Are You Firewise" notebook, produced by the Colorado State Forest Service, includes fact sheets and slides on topics including: firefighting vehicle accessibility to homes, water supply, defensible space. Video included.

Cost: \$10 for the VHS video; \$50 for notebook with video. *To order, write to:* Judy Serby, Colorado State Forest Service, Colorado State University, Fort Collins, CO 80523-5060, or call (970) 491-7559. *E-mail:* jserby@lamar.colostate.edu.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Planner/Architects/Builders/Contractors

Building a Firewise Home

Video (20:04 min.)

Provides prevention offices and those working with cooperators features that should be considered when building a home in the wildland/urban interface. Encourages builders and contractors to learn more about the particular features of homes susceptible to ignition from wildfire. Includes ways to improve a home's chances of survival by suggesting to homeowners use of alternative materials and design elements, and where to place structure in a firesafe location on lot.

Cost: Free. *Contact:* Firewise, 1 Batterymarch Park, Quincy, MA 02169.
E-mail: cblake@nfpa.org. Catalog No. FWC-601-97-V.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Planner/Architects/Builders/Contractors

Burning Issues CD

Florida State University and U.S. Department of Interior, Bureau of Land Management Multimedia program addresses wildland fire issues. High school and middle school students use interactive features to learn about role of fire in ecosystems. Four fire ecoventures are available to help students explore prescribed fire, and home and community protection/planning in wildland/urban interface. Activity requires users to put what they have learned to work when a wildland fire is reported.

Cost: \$2. *Order at* www.symbols.gov, click on National Symbols Catalog and Fire Education or *contact:* National Symbols Cache, 402 SE 11th Street, Grand Rapids, MN 55744, or call (218) 327-4282.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Students/Teachers/Kids

Colorado State Forest Service Natural Resources Series Fact Sheets

For Colorado homeowners and planners to protect homes from wildfires. Topics include defensible space, landscaping, home fire safety and vegetation. A homeowner wildfire preparation checklist, Firewise plant list, defensible space diagram and native grass tables provide information at a glance.

Available at www.ext.colostate.edu. Click on Drought/Fire, Fact Sheets, Fire Resources.

Cost: Single copy, free. Ten copies for \$1. Contact: Judy Serby, Colorado State Forest Service, Colorado State University, Fort Collins, CO 80523-5060, or call (970) 491-7559.

E-mail: jserby@lamar.colostate.edu.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Planner/Architects/Builders/Contractors

Communicator's Guide: Wildland Fire Book/Web Site

Book/Web site

Provides background information about all aspects of wildland fire including: ecological, social and policy aspects of wildland fire, programming ideas, sample materials and resources for communicators. Useful for everyone who communicates to the public about wildland fire including fire personnel, teachers, and community leaders.

Available at www.nifc.gov under Prevention and Education section.

Cost: \$7. Order at www.symbols.gov, click on National Symbols Catalog, then Fire Education.

By mail, contact: National Symbols Cache, 402 SE 11th Street, Grand Rapids, MN 55744, or call (218) 327-4282.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Students/Teachers/Kids

Developing a Cooperative Approach to Wildland Fire Protection

Book/Video/Web site

Addressing wildland/urban interface fire problems requires a community and interagency understanding of resource management challenges associated with urban growth, and is best accomplished at local levels where problems are most immediate. Describes process that may be adopted for use by many agencies for common purpose of fire protection.

Available at www.firewise.org. Click on Resource Section.

Cost: Free for booklet and video set. To order, contact Firewise, 1 Batterymarch Park, Quincy, MA 02169. E-mail: cblake@nfpa.org. Catalog No. FWC-600-97-V.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official

Federal Emergency Management Agency (FEMA)

Web site: www.fema.gov

Offers news releases, fact sheets, prevention and preparation information, situation updates, and checklists on wildfires and other disaster information. The FEMA for Kids wildfire section provides educational activities.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Students/Teachers/Kids

FEMA Region VIII Wildfires Web Site

Web site: www.fema.gov/regions/viii/fires.shtm

Offers wildfire-related information for Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming. Includes preparedness, prevention and assessment fact sheets and checklists, news releases on wildfire disaster declarations and assistance, Fire Management Assistance Grants, and links to other fire-related sites.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Students/Teachers/Kids

Fire Education Materials Web Site

Web site: www.symbols.gov

National Symbols Catalog's Fire Education section offers a variety of materials for educating children and homeowners. These newly developed materials expand on traditional fire prevention messages and include wildland fire ecology, fire behavior, fire suppression, recreational and home fire safety, wildland/urban fire protection.

Offers activity and coloring books, and other products for order by state agencies, fire departments, school teachers, and other authorized groups. Provides links to several fire-related Web sites with information for educators, and agency and state resources.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Students/Teachers/Kids

Firewise Communities

Pamphlet

Provides information to make homes safe from fires including tips for landscaping and maintenance, construction, a disaster plan, and emergency access.

Cost: Free. *Contact:* Firewise, 1 Batterymarch Park, Quincy, MA 02169.

E-mail: cblake@nfpa.org

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Students/Teachers/Kids



Firewise Communities/USA

Provides an overview of the Firewise Communities/USA program that aims to encourage and support action to minimize home loss to wildfire in fire-prone communities. Outlines basic steps ideal for small communities, developments and residential associations to assess wildfire risks and create their own networks of cooperating homeowners, agencies and organizations to identify and implement local solutions to the wildfire issue.

Cost: Free. *Contact:* Firewise, 1 Batterymarch Park, Quincy, MA 02169.

E-mail: cblake@nfpa.org.

Firewise Communities/USA: Creating a Firewise Community

DVD/Video (17:00 min.)

Firewise Communities/USA is a national recognition program developed to support and encourage fire-prone communities as they develop area-specific solutions to the wildfire issue. Series explains standards that must be met by participants and showcases efforts of five recognized Firewise Communities.

Cost: Free. *Order at* www.firewise.org. *Click on* Publications Catalog or *contact:* Firewise, 1 Batterymarch Park, Quincy, MA 02169. *E-mail:* cblake@nfpa.org. Catalog No. FWC-605-02V (VHS). Catalog No. FWC-606-02-DV (DVD).

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official

Firewise Communities Workshops are a Successful Part of a Comprehensive Program

Booklet

August 2002 National Fire Protection Association (NFPA) article reprint provides information about Firewise Communities workshops, and examples of communities across the nation and how they participated and benefited from the workshops.

Cost: Free. *Contact:* Firewise, 1 Batterymarch Park, Quincy, MA 02169.

E-mail: cblake@nfpa.org.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official

Firewise Construction Design and Materials

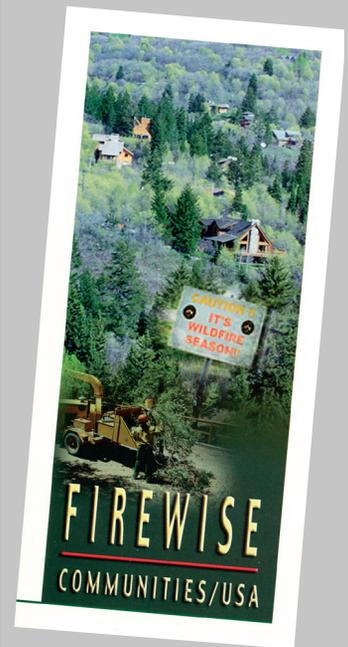
Book/Web site

Provides homeowners and builders in the wildland/urban interface with design and building techniques that can offer more protection from wildland fires. Photos, drawings and diagrams help illustrate information on fire behavior, including the effects of fuel, topography, weather and home site location.

Cost: \$2.25 each. *Contact:* Judy Serby, Colorado State Forest Service, Colorado State University, Fort Collins, CO 80523-5060, or call (970) 491-7559.

E-mail: jserby@lamar.colostate.edu. Also available at www.firewise.org/co/.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Planner/Architects/Builders/Contractors



Firewise Landscaping

3-part Video Series/Web site

Part I: **Firewise Landscaping** Part II: **Design and Installation** Part III: **Maintenance**

Provides an overview of landscaping design essentials in wildland fire-prone areas and how a well-planned landscape can offer effective protection from wildfire to any home. Offers suggestions to help homeowners shape their landscape for best effect and Firewise use of materials. Stresses maintenance in keeping Firewise landscape functioning as a resistive barrier to wildfire. Provides landscape professionals with ideas to create visual harmony and fire safety using appropriate landscape design principles. Useful for agency representatives when presenting wildfire prevention information.

Available at www.firewise.org. Click on Resources Section, or order free set. Contact Firewise, 1 Batterymarch Park, Quincy, MA 02169. E-mail: cblake@nfpa.org. Catalog No. FWC-612-93-V.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Planner/Architects/Builders/Contractors

Firewise Web Site

Web site: www.firewise.org

Designed to provide wildfire protection information for fire services and homeowners. Offers wildfire news, online publications catalog, and resource documents and videos. Provides links to several fire-related websites.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Planner/Architects/Builders/Contractors
Students/Teachers/Kids

Is Your Home Protected From Wildfire Disaster?

A Homeowner's Guide to Wildfire Retrofit

Book/Web site

Institute for Business and Home Safety

Provides homeowners with guidance on retrofitting and building homes to reduce losses from wildfire damage. Contains suggestions and recommendations on home landscaping, building materials and design, estimated costs, and wildfire protection checklist on precautions to take before, during and after wildfire strikes.

Cost: Free. Available at www.firewise.org. Click on Resource Section. For free guide, contact Firewise, 1 Batterymarch Park, Quincy, MA 02169. E-mail: cblake@nfpa.org. Catalog No. FWC-001-01-BK.

Suggested audience: Homeowners/Fire Service and Educators/Businesses

Living With Fire: A Guide for the Homeowner

Newspaper insert

This guide for homeowners features practical tips on firewise landscaping and building defensible space, as well as advice on what to do as wildfire approaches.

Cost: Call the Colorado State Forest Service in Fort Collins, Colorado, for a free copy. (970) 491-6303.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Planner/Architects/Builders/Contractors

Living With Wildfire

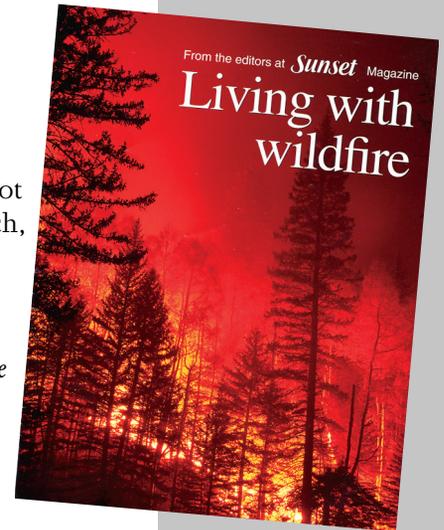
Booklet

Sunset Magazine, April 2001

Provides a history of major wildfires in the western United States. Focuses on pilot projects as models for forest fire reduction. Features successful education outreach, disaster preparedness and burned land rehabilitation efforts. Provides tips on creating defensible space around homes and information to assist homeowners, planners and builders determine the fire-resistance of roof types.

Cost: Single copy \$3.50 or \$1.25 each (for 100 or more) plus tax/shipping. *Write to:* Living With Wildfire, Editorial Services, Sunset Publishing Corp., 80 Willow Rd., Menlo Park, CA 94025.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Planner/Architects/Builders/Contractors



Living With Wildfires: Prevention, Preparation & Recovery

Book

Bradford Publishing, May 2003

Details the process of correctly landscaping property to create defensible space. Also contains helpful information about what to do if you have to evacuate your home, including checklists and other methods of preparation. Includes advice about what to do before you return home after a wildfire. Also includes an extensive list of resources for homeowners.

Cost: \$19.95 Visit www.bradfordpublishing.com or call (303) 292-2590.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Planner/Architects/Builders/Contractors

Making Your Home Firewise

Video (22:29 min.)/Web site

Ideas and techniques for homeowners when constructing or modifying homes in wildland/urban interface areas. Gives homeowner initial Firewise property assessment. Topics include roofs, windows, eaves, decks, and landscaping. Provides information that a prevention officer or anyone with cooperative duties can use in presentation or discussion for various local groups.

Cost: Free. Available at www.Firewise.org. Click on Firewise Resources. *Contact:* Firewise, 1 Batterymarch Park, Quincy, MA 02169. *E-mail:* cblake@nfpa.org. Catalog No. FWC-620-01-V.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official

National Fire Protection Association (NFPA)

Web site: www.nfpa.org

Information on NFPA's mission of reducing fire and other hazards by providing and advocating codes and standards. Research, training and education are available. Also provides online catalog offering thousands of fire prevention and education videos, books and other products.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Students/Teachers/Kids

National Interagency Fire Center (NIFC)

Web site: www.nifc.gov

Offers current information on wildland fire, prevention and education, wildland fire statistics, and links to other fire-related sites, guides and publications.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Students/Teachers/Kids

National Wildfire Coordinating Group (NWCG)

Web site: www.nwcg.gov

Offers electronic bibliography of wildland fire Web sites and order catalogs of wildfire prevention materials. Also provides fire education documents for teachers and educators.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Students/Teachers/Kids

The Oakland/Berkeley Hills Fire Book and Video

Video (22:00 min.)/Book/Web site

NFPA

Case study of 1991 Oakland/Berkeley Hills Fire in California. Documents fire, explains variables causing destruction and makes recommendations to prevent similar occurrences. Encourages discussion and assists planners, local officials, fire service personnel, and homeowners in developing fire-safe homes and communities in wildland/urban interface.

Cost: Free. *Document and video available at* www.firewise.org. *Click on* Firewise Resources. *To order, contact:* Firewise, 1 Batterymarch Park, Quincy, MA 02169. *E-mail:* cblake@nfpa.org. *Catalog No.* FWC-604-92-V.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Planner/Architects/Builders/Contractors

Planning for Water Supply and Distribution in Wildland/ Urban Interface: Operation Water

Video (22:00 min.)/Book

NFPA

Provides information to assist firefighters, homeowners, and local officials plan for water supply and distribution in wildland/urban interface. Implementing plan will help meet water requirements for specified area and improve firefighting capabilities.

Cost: Free. *To order, contact:* Firewise, 1 Batterymarch Park, Quincy, MA 02169.

E-mail: cblake@nfpa.org. Catalog No. FWC-621-92-V.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official

Protecting Your Property From Wildfire

Pamphlet

North Dakota Forest Service

Checklist helps homeowners evaluate the fire-safe condition of their homes or farmsteads in their surroundings. Provides a list of circumstances to be evaluated to measure wildland fire safety.

Cost: Free. *To order, contact* Colleen Reinke, North Dakota Forest Service, 1511 E Interstate Ave., Bismarck, ND 58503.

E-mail: Colleen.Reinke@ndsu.nodak.edu or call (701) 328-9990.

Suggested audience: Homeowners/Fire Service and Educators/Businesses

Saving Homes from Wildfires: Regulating the Home Ignition Zone

Booklet

American Planning Association Zoning News, May 2001

Examines threat to wildland/urban interface zone where wildfires can potentially ignite homes and determine how development codes can be used to save residential areas.

Cost: \$5. *Contact:* Zoning News, American Planning Association, 122 S. Michigan Ave., Suite 1600, Chicago, IL 60603. *E-mail:* zoningnews@planning.org.

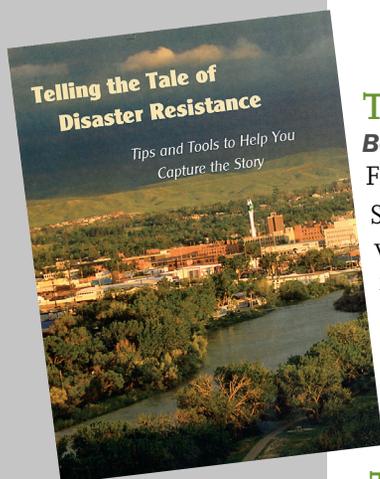
Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Planner/Architects/Builders/Contractors

Smokey Bear

Web site: www.smokeybear.com

Provides activities for children in kindergarten through 5th grade including forest and fire facts, the Smokey Bear story, and fire prevention rules. Also has teacher's and wildland fire communicator's guides featuring lesson plans on ecology and wildland fire.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Students/Teachers/Kids



Telling the Tale of Disaster Resistance

Book

FEMA

Step-by-step guide on how to document disaster-resistance efforts. Offers guidance for developing story leads, researching and documenting projects, and creating and promoting a finished product.

Cost: Free copies while supplies last. *Contact:* FEMA Region VIII Office of Public Affairs, Building 710, Denver Federal Center, Denver, CO 80225 or call (303) 235-4909.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official

Ten Steps to Being Firewise in North Dakota

Pamphlet

North Dakota Forest Service

This 10-step wildfire mitigation brochure provides homeowners with information to help create defensible space around the home, and to become more knowledgeable about wildfire conditions in North Dakota.

Cost: Free. *Contact:* Colleen Reinke, North Dakota Forest Service, 1511 E Interstate Ave., Bismarck, ND 58503. *E-mail:* Colleen.Reinke@ndsu.nodak.edu or call (701) 328-9990.

Suggested audience: Homeowners/Fire Service and Educators/Businesses

U.S. Fire Administration (USFA)

Web site: www.usfa.fema.gov

Provides fire-related information, links, and publications for fire service and public. Fire service section provides current wildland fire information and news. USFA's kids page offers fire games and activities, home fire safety information, and guide for parents and teachers.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Students/Teachers/Kids

U.S. Forest Service — Fire and Aviation Management

Web site: www.fs.fed.us/fire

Information on latest wildfire news, wildland fire safety, prevention and education, and link to publications.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Students/Teachers/Kids

Wildfire Home or Farm Hazard Rating

Pamphlet

North Dakota Forest Service

Brochure provides homeowners with simple method to conduct a “Wildfire Home or Farm Fire Hazard Rating” for their residences or farmsteads.

Cost: Free. *Contact:* Colleen Reinke, North Dakota Forest Service, 1511 E Interstate Ave., Bismarck, ND 58503. *E-mail:* Colleen.Reinke@ndsu.nodak.edu or call (701) 328-9990.

Suggested audience: Homeowners/Fire Service and Educators/Businesses

Wildfire Mitigation in the Wildland/Urban Interface

Video (17:52 min.)/Web site: www.cnr.colostate.edu/FS/restoration

Colorado State University

Showcases small-scale harvesting equipment options available for people interested in reducing wildfire hazard on small acreage units. Helps viewer understand change in forest structure through past 100 years, and implication to wildfire activity. Educational for all audiences including homeowners and contractors.

Cost: \$6 plus tax and shipping/handling. *Call* (877) 692-9358.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Planner/Architects/Builders/Contractors

Wildfire News

Web site: www.wildfirenews.com

Useful for firefighters and others interested in wildfire-related topics. Provides current worldwide news, fire reports, maps, and information on fire protection and prevention, safety, and employment. Links to fire-related sites including fire agencies and organizations, classified job ads, training, and products.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official

Wildfire! Preventing Home Ignitions

Video (19:00 min.)/Web site

Describes how a wildfire can ignite a home. Homeowners will learn how the combustion process causes home ignitions, how some homes are destroyed while others survive, and how most effective home protection efforts can occur with “Home Ignition Zone.”

Available at www.firewise.org. *Click on* Firewise Resources.

Cost: Free. *Contact:* Firewise, 1 Batterymarch Park, Quincy, MA 02169.

E-mail: cblake@nfpa.org. Catalog No. FWC-623-01-V.

Suggested audience: Homeowners/Fire Service and Educators/Businesses

Wildland/Urban Interface Fire Hazard Assessment Methodology

Book/Web site

Helps homeowners, businesses and planners assess potential of fire on homes in existing housing developments and planned new developments in a wildland environment. Offers five-step method for assessing hazards of wildland/urban interface area.

Cost: Free. *Available at* www.firewise.org. *To order, contact* Firewise, 1 Batterymarch Park, Quincy, MA 02169. *E-mail:* cblake@nfpa.org. Catalog No. FWC-003-98-BK.

Suggested audience: Homeowners/Fire Service and Educators/Businesses
Community/Local Official
Planner/Architects/Builders/Contractors

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U.S. Forest Service

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Bureau of Land Management
National Park Service

Other Agencies/Organizations

AmeriCorps
Fire Education Corps
FIREWISE Communities
National Fire Protection Association
National Interagency Fire Center
Student Conservation Association

Colorado

Big Elk Meadows Volunteer Fire Dept.
Boulder Fire Dept.
Cherryvale Fire Protection District
City of Boulder, Planning & Development Services
Colorado Office of Emergency Management
Colorado Springs Fire Dept.
Colorado State Forest Service
Durango & Silverton Narrow Gauge Railroad
Estes Park Volunteer Fire Dept.
Fire Ready, Inc.
Garfield County Emergency Management
Jefferson County Public Information Office
Mesa Verde National Park
Rocky Mountain Coordination Center
Rocky Mountain National Park
Routt County Emergency Management

Montana

Broadwater County
Jefferson County
Lewis & Clark County
Montana Division of Disaster and Emergency Services
Montana Heritage Preservation and Development Commission
Northern Lights Magazine
Tri-County Fire Working Group
U.S. Forest Service Rocky Mountain Research Lab
Virginia City Volunteer Fire Dept.

North Dakota

Advanced Tree Service
Bismarck Fire Dept.
Bismarck Forestry Dept.
Bismarck Planning & Development
North Dakota Division of Emergency Management
North Dakota Forest Service

South Dakota

Black Hills National Forest
Black Hills Harley-Davidson
Custer Volunteer Fire Dept.
Fenske Media Corporation
South Dakota Black Hats

South Dakota Division of Emergency Management
South Dakota Wildland Fire Suppression Division
Sturgis Motorcycle Rally National Fire Prevention Team
Sturgis Volunteer Fire Dept.
T&M Photography

Utah

Big Cottonwood Canyon Wildfire Committee
Community Solutions
Sundance Resort
Town of Brian Head
Utah County
Utah Dept. of Natural Resources
Utah Division of Emergency Services and Homeland Security
Utah Division of State Forestry, Fire and State Lands
Utah National Guard
Utah State University
Woodland Hills Fire Dept.

Wyoming

Jackson/Teton County Fire Dept.
SavaFilm
Wyoming Emergency Management Agency

Photographs

All photographs were taken by FEMA employees except:
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Boulder, CO
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